



# POND BOSS

DEDICATED TO MANAGING PRIVATE WATERS

Volume XVI, No.5 March/April 2008

**Special Edition-Aeration**

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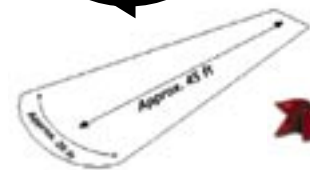
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**Mike Otto** is a veteran earth mover with 30+ years experience building primo lakes. His mission is to help landowners achieve their goals by building everything from fence lines to living lakes to house pads. He has built golf courses to great bass fishing lakes. Reach Mike at [mikeotto@ottosdirtservice.com](mailto:mikeotto@ottosdirtservice.com) or on his cell phone (seriously) 940.736.5333



**Sherman Wyman** is a CPA by trade, but a conservationist by passion. He is a fervent student of land management and has been writing about it in Pond Boss for more than three years. His studies and practices are based on fundamental range management bound with cutting edge thinking. Reach Sherman via email at [SGWyman@UtleyGroup.com](mailto:SGWyman@UtleyGroup.com)



**Dan VanSchaik** is an internationally known wildlife biologist and consultant. He focuses on landowners improving land management for wildlife. He has a broad-based knowledge of flora and fauna, with practical hands-on experience from waterfowl to upland birds to deer to elk to range management. He has the best overall knowledge of wildlife environmental issues as any wildlife specialist in the country. Reach Dan via email at [danv@texoma.net](mailto:danv@texoma.net)



**Dr. Dave Willis** is a long time fisheries professor and now head of the department at South Dakota State University with a passion for science and research of practical fisheries management. He works with some local landowners studying ponds and improving fisheries. Dr. Willis spends countless hours on the Pond Boss website, answering questions for energetic pond owners. Reach Dr. Willis at [www.pondboss.com](http://www.pondboss.com).



**Mark Cornwell** is a professor in the fisheries department at State University of New York in Cobleskill, New York. From foothills of the Catskills, Cornwell teaches fisheries with plenty of field trips for hands on experience. Cornwell works with a handful of private landowners and public waters, providing data collection services and analysis. He also assists with aquaculture projects with the college.



**Mike Mitchell** is a respected seasoned fisheries biologist based in Longmont, Colorado. He is Senior Aquatic Biologist of Queen of the River Consultants, Inc. Mike has a passion for the Rocky Mountain west, serving clients with projects ranging from trout stream renovation to small pond management to urban ponds. Reach Mike at [mike@qorconsult.com](mailto:mike@qorconsult.com) or call his office at 303.651.2514.

**Editor**  
Bob Lusk



**Field Advisory Staff**  
Greg Grimes Dr. Dave Willis, Sherman Wyman, Malcolm Johnson, Mike Otto, Mac McCune, Norman Latona, Dan VanSchaik, Mike Mitchell, Mark Cornwell, Bill Cody, Dr. Bruce Condello, Cecil Baird, Gary Valentine

**Layout/Design**  
Jim Stroud

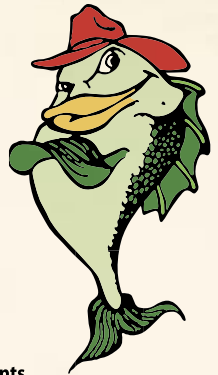
**Office Manager**  
Kathy Lovell

**Contributing Writers**  
Bill Cody  
Richard Peterson  
Bruce Kania

**Election Judges**  
St. Patrick  
Easter Bunny

**Human Growth Hormone Consultants**  
Andy Pettite  
Roger Clemens

**www.pondboss.com Website Moderators**  
Eric West, Dave Davidson  
Dr. Bruce Condello, Theo Gallus, Bill Cody  
Sunil Ramchandran



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POND BOSS welcomes reader input, if you dare. Send photos, cut bait, broken secchi disks, your personal pond stories, cartoons and new ideas for fish stocking to: Pond Boss, P.O. Box 12, Sadler, Texas, 76264. Actually, we are always looking for more literary genius from our readers. Or, e-mail the editor at [pondboss@texoma.net](mailto:pondboss@texoma.net). Remember to think outside the box.

**Subscriptions:** Home delivery is \$35 for six issues per year in the U.S., \$42 in Canada, free to the first pondmeister to contact us from Snook, Texas.

**Cover Photo:** Lighted 3/4 hp Sequoia fountain installed by Ken Rust at Absolute Aquatics in Chef John Folse pond. Building is his reception hall at White Oak Plantation in Baton Rouge, Louisiana. Photo courtesy Kasco Marine, Inc.

Be sure to check out the  
Special Aeration Section  
beginning on page 35.

# The Eyes of March



Last January, on the 12th, to be exact, Lusk Lodge, Two was host to the first ever Pond Boss Moderator's Retreat. Those guys who police and nurture the Pond Boss website gathered for a weekend think tank of idea exchange. The brain trust in the room was fascinating. For most of the day, Mike Otto and Dave Davidson, from Texas, Dr. Bruce Condello, Nebraska, Eric West, Mississippi, Bill Cody and Steve Saunders from Ohio, Sunil Ramchandran, Pennsylvania and Dr. Dave Willis from South Dakota collected around a big table and traded their thoughts. These are a passionate group of people.

The mission?

To improve the magazine and clarify the vision for the ever-growing website.

There were plenty of ideas. Cody was adamant about adding more details and graphics to the stories. He's convinced we should de-emphasize the literary side and add more science to the "how to." Some of his ideas are in this issue. See if you can find them. All of them like the writing style and told us not to change it. Several of the guys suggested diversifying the content without changing the categories. This issue, we have done that, too. The group suggested we create "modules" of information to sell. Of course, Condello suggested we collect all the stories ever written about bluegill, mold them into a booklet and sell them to interested bluegillers.

They suggested we hire an associate editor to do the work.

As I sat there thinking about the concept of diversifying and modulating, it hit me. "Let's do a 'special issue' with a major focus on one topic." Everyone looked at each other, shrugged their shoulders and seemed underwhelmed.

All their ideas have been fermenting in my way-too-busy brain. So, as these thoughts continue to escalate from grape juice to bold Stag's Leap, we took action.

Drum roll, please.

This issue of the magazine is all about "aeration." Here's what happened. I decided to contact every advertiser we have who sells aeration equipment and invite them to write a story with one caveat...it couldn't be an "advertorial" where the mission is to sell you something. The mission was clear...write about the topic of aeration. I had one fear. What if they all write the same thing? My right-brain fears were assuaged as my left-brain said, "So what? We'll get a consensus. Each writer's thoughts will be a semblance of their intelligence that our readers will be able to ingest, digest and make wiser decisions."

All that worry was for naught. While there are a few good redundancies, each story carries its own wisdom. So, enjoy this smorgasbord of facts and opinions from the nation's best experts on pond aeration. One funny thing...ten years ago people didn't aerate recreational ponds. Here we are now...everyone should aerate. Oh, and as you will see, I wrote a sidebar about each company that was kind enough to supply a story. With this issue, you will be able to understand as much as there is today about when, why and how to matriculate, then aerate and circulate in the Pond Boss University of Pristine Water Management.

This "module" idea won't stop here. Next issue, we have already lined up an array of stories about the "how to" of feeding fish. That's funny, too. 25 years ago, you just bought a bag of catfish food, got a scoop and tossed out some nuggets to see who would come to dinner. Nowadays, there's a method and a food for everything...from specialized feed for special fish to living game fish fed to bigger game fish.

On top of all the aeration stories, this issue of Pond Boss has all the regular stuff. But, we have made a couple of changes with those, too. There's Know Your Pond Life...this time written by Pond Boss fan and ardent pondmeister Bob McFarland.

When I read his story, I wanted to stop what I was doing and put up wood duck boxes everywhere. Cornwell has a cool story about how to make your fish give up their lunch so you can seriously study what they eat, Willis stays in the mood of this issue with a story about an aeration research study at South Dakota State University, Otto tells of a man, his land and the oldest lake in that county, Dan V wrote of a successful wildlife program in farm country, Wyman tells why his quail are starving in a field full of food, Mitchell marries a fishing pond management strategy to his community and immediately brings kids into the family, and, oh yes, we have all the other regular stuff as Pond to Plate, Ask the Boss and News Shorts. In honor of the upcoming Easter season, we also invite you on our very own Easter egg hunt. Go through the entire magazine and see if you can find the new advertisers. We have several. They see something in this magazine.

As always, thanks for being here, thanks for reading the words of wisdom in the nation's leading pond management niche magazine. If something is on your mind and you wish to share, drop me an email at [pondboss@texoma.net](mailto:pondboss@texoma.net).

Fish on.

A handwritten signature in black ink that reads "Bob Lusk".

# Success on the Prairie

by Dan VanSchaik



*One of the fruits of Shawn's labor.*

Two years ago, I got a call from pondmeister Shawn Svob who was interested in expanding upland wildlife. It was early spring. Shawn was anxious for food plot recommendations, so I quickly scheduled a visit to his properties in Grant and Garfield Counties, Oklahoma, in the north central part of the state.

As I drove north and turned off the Interstate highway near his home, the route became a maze of narrow country roads that follow section boundaries on huge farm fields stretching to the horizon. These fields were lush green with winter wheat crops. Trees and brushy areas were scarce. Any remnants of past forestation were tightly confined to riparian systems following streams, rivers or drainage basins.

This was a true prairie ecosystem. I realized our work was cut out for us. We would have to compete with the world's biggest food plots and manage cover habitat that annually gets mowed to the ground to make room for bigger farm fields.

At first sight over these flat farm fields, we wonder where wildlife can hide and how they move about in such unprotected landscape. I've learned from past experiences that if birds and animals don't have adequate structural cover, they use the cover of darkness and become predominantly nocturnal. This is a common problem with game management. I knew we would have to design a strategy to alter that behavior, somehow.

I found Shawn very enthusiastic about promoting upland wildlife around his lakes and ponds and eager to develop a plan that would improve game visitation to his properties. He is "wildlife savvy" and familiar with basic conservation principles.

After a general overview tour of his farms, it was also evident he had a head start on habitat creation and protection. He was well aware of the "Great Plains wheatland mentality" that has endorsed widespread removal of all brush lines, fencerows, ditch banks, thicket patches and roadsides...those are areas considered unproductive to agriculture, you know. I was

impressed with his reestablishing cover strips and protected travel routes. More than half his property lies inside a strong riparian basin on the Salt Fork of the Arkansas River, so I knew we had a "highway" in place for population movement.

We spent the rest of the day hammering out management strategies and I followed up with a preliminary wildlife plan of action.

During the following year and a half, Shawn kept me updated on his progress and we frequently exchanged ideas on feeders, food plots, game cameras, and hunting practices.

This past January, 2008, Shawn invited me, with my son, for some Northern Oklahoma pheasant hunting. Besides obvious recreational value, this trip gave me an opportunity to evaluate success of his wildlife program within the context of local environment from ground level. Not only did we walk his properties, but also several adjacent farmlands.



*The Salt Fork of the Arkansas River flows near Shawn Svob's property. It's a center point for wildlife habitat in the area.*

---

**He could have viewed his low-fenced 140 acres as "a drop in the bucket" when compared to thousands of farm acres surrounding him, but instead we chose to make his property an "oasis in the desert".**

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*continued on page 8*

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*Left: Notice the prairie pothole water sources scattered over this mostly agricultural area. One of the obstacles Svob had to overcome was the wide expanses of grain fields all around him. Right: This riparian area provided congruency between Svob's property and much of the "natural" habitat for nearby wildlife. That's Shawn's lake in the mid-right side of the photo.*

I was pleasantly surprised at the development of his wildlife management areas. Given his regional limitations, along with a roller coaster of drought and flood conditions since our first meeting, I felt his significant accomplishments noteworthy and of particular interest to those of us fighting the same battles.

He could have viewed his low-fenced 140 acres as "a drop in the bucket" when compared to thousands of farm acres surrounding him, but instead we chose to make his property an "oasis in the desert". A desert of wheatland, that is.

Although wheat is a desirable multi-season wildlife forage, it constitutes the dominant upland vegetation in that region; so it only makes sense to attract more wildlife by offering some diversity and alternative food sources. Besides, these wheat fields often remain vacant between crops (early July harvest and September planting) leaving them periodically void of forage or cover for wildlife.

Our plan targeted deer, pheasant, quail, dove and waterfowl and we needed to provide some special treats within protected cover.

#### **Deer**

Since formal food preference studies yielded overall forage class use patterns of; 44% forbs, 41% browse, 13% grasses and 1% others (various mushrooms), we modeled our food plot varieties as such. Of that browse portion, about 10% was made up of acorns and there are no oak trees within a 75 mile radius of Shawn's property. A high energy grain source had to be substituted for the lack of hardwood mast. Realizing deer require high protein content food (16%-22%), Shawn offers free choice Deer Chow mixed with whole grains

year-round. There is also definite behavioral advantage to year-round supplemental feeding, as deer learn they can count on this source and will incorporate feeders into their daily routine. Does imprint fawns to feeders within their first 2 months creating "programmed" young adults. Keeping feeders active will also pull deer in from adjacent properties when others shut down during non-hunting months.

As reported in past discussions, the average home range of white-tailed deer is about two square miles, except during breeding season or in times of drastic climatic change. Young does tend to stay close to their birthplace and mature bucks, by age 5.5 years, have reduced their range to 450 acres. This is particularly great news for deer managers like Shawn on unfenced or low-fenced properties as the data indicates mature bucks can be encouraged to reside within small local areas. His local deer bloodlines are from nearby Kansas influence so he has some premium genetic potential for desirable trophy production in the native herd.

#### **Pheasants & Quail**

We know that survival and reproduction of upland game birds is dependent on the protein quality in their diet. Bobwhites require up to 28% crude protein for optimum growth and reproduction. Game birds are known to eat at least 30 different kinds of insects which comprise up to 20% of total diet. Greens (the leaves and stems of grasses and herbaceous plants) constitute 13-15% of diet, with the balance made up from seed producers. Our management strategies resulting in a diverse seed base and high insect densities provide the best opportunity for meeting essential

nutritional requirements of game birds.

Establishment of native preferred plants and green food plots was incorporated into our long-term plan, but during the process, supplemental dry feeds are always necessary to sustain resident populations. Shawn began an upland feeding route where specific bird areas are "chummed" with a wild bird mix on a weekly schedule. This method adequately reaches natural bird distribution, but keeps disease and predator pests from exploiting concentrated populations that are often associated with stationary feeders. Since pheasants and quail are basically grassland birds that require habitats composed of about 65-75% herbaceous plants and 25-35% woody cover, Shawn designed his bird areas to accommodate this habitat pattern. He created travel routes and planted artificial cover that connects patches of dense natural vegetation.

#### **Doves**

Doves are seedeaters and thrive on a variety of agricultural and nonagricultural plant seeds. In addition to the feed chum routes, wild fields and fence-rows are managed for seed producing weeds and grasses to sustain breeding doves until food plots ripened. Dove have a proclivity to land in dead trees or power lines before watering and feeding (staging) and are particularly fond of gravelly soils around small watering holes with exposed shoreline. This preference fit well with some old cottonwood stands on low-level ponds near his food plots. The availability of food and water determines the length of time doves will stay in an area (if

*continued on page 16*



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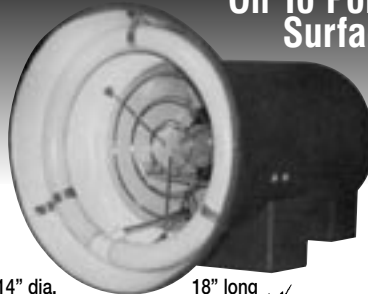
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# Ask the Boss

**Q:** I have just started a new pond approximately 1/2 acre. Measures 120 ft x 100 ft x 10 ft deep max. It was formed as a caliche borrow pit for my ranch road project. In its original form, it leaked. I have now lined it with Bentonite using the sandwich method. It appears to be holding water. I have filled it by pumping clear aquifer water. I am interested in gathering information on stocking and appropriate plants to add. It's rather bare at the moment. I don't know that the caliche will support much growth. Utopia, Texas, 22 miles north of Sabinal doesn't get lots of rain. I will use the pond for family recreation and don't plan to grow monster anything. Easy pan fryer fish for the little and big (me) kids will be fine. I am in process of adding a floating pier and submerged shelter/breeding areas. I have added three 12 inch x 4 ft concrete culverts in approx 4-5 ft of water. I am planning to add an additional 10 and 4 in groups of 40 in PVC bundles at four foot depth. Based on my current reading, your book "Basic Pond Management," I plan to add fathead minnows, channel catfish and coppersnake. Based on your book's recommendations, this appears to be the best combination for water of this size. It seems bass are not in the equation. I have not found any reference on aquatic plant life or perimeter habitat. Thank you,

*Dennis Smith  
Houston, Texas*

**PB:** Sounds like you have put together an excellent plan. Stay the course for adding the concrete structures as well as the PVC bundles. Here's a good tidbit of information to follow. Be sure you put all these different structures in water 4-8 feet deep. Remember, different sizes and different species of fish have different habitat requirements and different behavioral habits. Little fish prefer to hide in dense structure, like brush or cedar trees. Mid-size fish as 10-13" bass prefer to run in schools, lingering near the areas which baitfish inhabit. That leads me to bass. There's no reason you can't have a few bass. Your pond just simply can't support many. But, it can surely support 15-25 adults. If you don't want bass, then rethink the coppersnake bluegill. Those bluegill will reproduce heartily and you will wind up with too many of them. If bass are out of your choice range, consider stocking hybrid bluegill instead. They are basically a "put and take" fish. Stock so many, account for attrition and harvest, stock more later. Regarding your wish to plant vegetation, my recommendation is not to worry about it. If there are nutrients in pond bottom soils in shallow water, plants will grow. Odds are, you will wind up with native species

of plants fairly quickly. If you need to plant something for erosion control or to enhance the landscape, go ahead and do it. Pick your plants based on those goals.

**Q:** Bob, a friend sent me these pictures of a mess on his pond South of Waco, Texas. It looks like dying duckweed to me. Your thoughts?

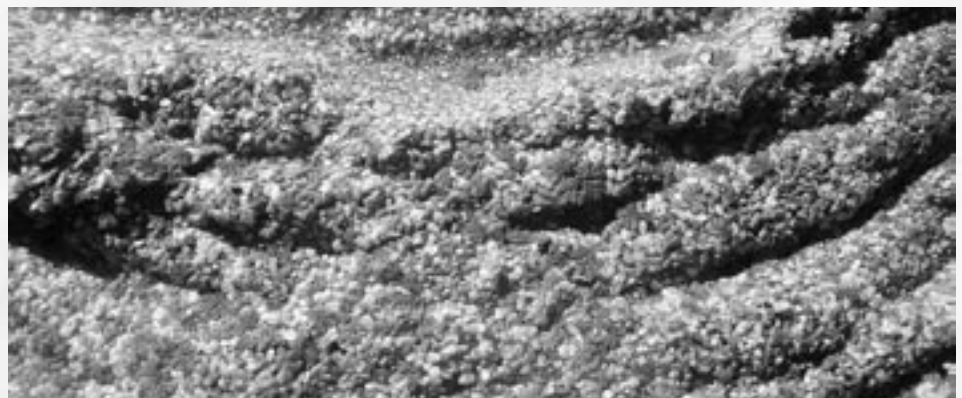
*Dave Davidson  
Hurst, Texas*

**PB:** There are two plants. In the close-up photo, blow it up and you will see little green round leaves. That's the duckweed. The maroon-looking feathery-type little critter is called Azolla, or water fern. Water fern is a nasty one. Your friend probably needs some help with it. The photo of the larger pond and its mass looks to mostly be azolla.

Have them contact Paul Dorsett at Total Lake Management in Bryan/College Station or Malcolm Johnson of Johnson Lake Management in San Marcos. Or, if they want to try to tackle it themselves, place a call to Kelly Duffie with Estes, Inc., in Houston.



*On the windward shore, a mix of duckweed and azolla.*



*This is a mix, mostly of azolla, blown across the pond. This can be a tough problem to solve.*

Paul Dorsett



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**Q:** Curious to know if you know of a way to monitor water temperature across the country. We are looking for a way to report, nationally, on the spawn. Is there such a national weather map that reports water temps similarly to the way you see TV (air) temperature maps? Thanks

*Carlton Viers  
Bill Dance Outdoors  
Memphis, Tennessee*

**PB:** I don't know of a way to monitor water temperatures around the nation. Some of that data is available, if we look for it, from cities which monitor their nearby lakes, mostly for potable water. But, even if you could find the temperatures, they will only show trends for that body of water. Different lakes respond differently to air temperatures. For example, Kentucky Lake temperature profiles would be totally different than Herb Parsons Lake which will be totally different than Reelfoot...even though all those lakes sit along a similar latitude. I bet if we look at the TV maps of those regions, the air temps would be similar. But, the water temps wouldn't. I think it would be great to monitor water temps all over the nation. That would tell us volumes, much more than info about spawns. Here's something pretty cool. I have 8 ponds on the 12 acres where I live. Right this minute, all 8 have different temperatures. One has almost 1/2 inch of ice on it. Its temperature, under the ice, is 38. One, adjacent to it, separated only by a levee, has no ice, but the temperature in it is 35. Another one, a narrow one sitting under a bunch of trees at the lowest part of our place, is 41...it is much deeper than the others. Water is pretty cool, so to speak.

**Q:** Dear sirs, Can I please ask you NOT to send me any further copies of your journal. It is excellent but I do not work in this area any more and it is waste of your funds to send to me the magazine which I throw immediately away. So it will help a little to save the planet with less airfreight. Many thanks and kind regards.

*Austen Sutton  
Syngenta Crop Protection AG  
Professional Products  
Switzerland*

**PB:** Sure, we'll take care of it. We hate to see it wasted, too.

**Q:** Your article in Pond Boss Vol. XVI, No. 2; Sep/Oct 2007, p. 24 about Purina's new or pending bass food ended by stating "stay tuned." What is the status of the product? Is

it now commercially available? If so where are the distribution points? What has your experience been with it? Should I contact Purina or Dr. Griffin directly for this type information? Thanks for your time and for a publication which fills a real need.

*Dr. David Greer  
Henrietta, Texas*

**PB:** My experience with this feed is exciting. While our feed trained bass readily eat Game Fish Chow, they erupt and actually attack the new, larger feed, like its prey, rather than a nugget. Plus, the bass are considerably more robust, just after a few months of eating the new product. You should be able to purchase the new feed from any Purina dealer. Try Berend Brothers in any of their stores in the Wichita Falls area. I have always found them to be helpful. Here is the information to help your dealer order the feed. It's called, "Aquamax Largemouth" The code is 5DA1Z8P and E1#-0066904. Let us know if you still can't get it and we will put the dealer in touch with Dr. Mark Griffin, the man who developed the feed.

**Q:** First, I would like to tell you how much I enjoy reading your magazine and like someone earlier said, "it is certainly one of a kind." Even the ads are interesting. I have a pond that is about 25 years old and is approximately 4-1/2 acres. Recently, I have been really bothered by beavers. I got the state trappers finally to actually kill them, only after they unsuccessfully tried to trap them. Now, I find I have another one and if there was any way for me to trap it myself, I would certainly like some advice. I do not have any idea where you would purchase a trap nor what to bait it with. Any advice you could give would be very helpful.

*Jim Box  
Houston, Texas*

**PB:** (We tracked down wildlife expert Dan VanSchaik for his answer...here are his words) Having removed the original beaver creates a natural "vacuum" that actually attracts other beavers. Whatever attracted them in the first place, attracts them again. Due to heavy spring rains last year and high water levels most of the year, beavers have found homes where they have never been before. So, expect beavers to be an ongoing issue at your place. While you could probably still enlist the assistance of a state agency, my recommendation is to learn how to trap them yourself. Buy a 330 Conibear trap. Be extremely careful and take the time to learn how to properly set it. It is a killer trap, so treat it with respect. In Texas, 90% of beavers live underneath a bank. You should be

able to find it fairly easily. I use an 8 foot steel rod, probing along the shoreline where I think beavers enter their den. When you poke a rod into the shoreline mud, it's solid. But, when you find the entrance, there's a void. The rod will easily push through. This is where you set the trap. Find this place and set your Conibear trap in the entrance, under the water, where the beaver must go through it. There's almost always a muddy stream leading into the area. If you can't work along the shoreline from above, poke around from a boat. Beavers are creatures of habit. The same beavers use the same hole over and over again. Regarding where to buy traps...go online and order them. Also, for our readers nationwide, be sure to check local and state laws. Some states won't allow certain types of traps to be used.

**Q:** Could you please advise us on where to purchase the floating islands you have been talking about in your magazine? My husband and I are very interested in buying one. We want to build a home for our ducks that predators cannot get to, and we thought one of these islands would be perfect. I just need to know where to get them. Thanks in advance for any help you can provide. Also, we love the magazine. I especially enjoyed reading who

your dog whisperer is. Keep bossin'!!!

*Melton and Heidi Wright  
Troup, Texas*

**PB:** I'll copy your email to our friends at Floating Island International. They can sell direct or through a distributor. They have a distributor in Fort Worth, for sure. They will be glad to hear from you. Or, call direct at (800)450-1088 or email Bruce Kania at [bruce@floatingislandinternational.com](mailto:bruce@floatingislandinternational.com) or go to their website at [www.floatingislandinternational.com](http://www.floatingislandinternational.com).

**Q:** I am an avid reader of your magazine and value your ideas. I have tons of questions always in the back of my mind while fishing and managing my ponds. I built a new 7.5 acre pond which was completed in April of 2006. I have attached a few pictures of building, half full and full pool. It is spring fed with the deepest part at 30 feet. As you can see, it has a lot of structure in it and we added some additional things. I put in fathead minnows and shiners the first year to get a food chain established. Then bluegill, crappie, channel catfish and largemouth bass fingerlings. We have been icefishing it lately to get an idea of how they are growing. Unbelievable growth

rate, cats are almost two pounds, crappie 12 to 13 inches and fat. I am also feeding them with a feeder about 100 pounds a month. My question is should I add additional shiners every year? I talked with Max Vickers at Anderson Minnows and he highly recommended that I do. Have not seen any articles about this subject, but maybe I missed one. Attached are some pictures of my pond. Also wonder how many fish should I take out and do I harvest the larger crappie etc? I know that is another lengthy discussion. Thank you,

*Fred Wright  
Southeastern Nebraska.*

**PB:** Let me tackle these questions, one at a time. First, the lake looks great. Let me tell you why. Several years ago, I would have thought you have too much cover. But, I see that you placed your fish structure at different depths. That's a good move. I had a long talk with Bill Dance some time ago and he made me understand the value of cover in deep water. Basically, it revolves around fish suspending during the extreme months of summer and winter. Your question about the shiners...it sounds like they cost around \$1 per 1,000. If that's the case, even if double that price, that's well worth the money, especially if your pond

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*Fred Wright's pond, about half full. Notice the trees, brush and cover for fish in a variety of depths.*

has any bloom on it at all. Funny you should ask that question about an article. Just last night, I dispatched a good friend of mine, and an outstanding outdoor writer who works with Anderson's, Larry Bozka, to write an unbiased story about stocking big numbers of fry. That story is scheduled for May-June. Your last question, about harvest, will be answered by your fish. At some point, your fish will begin to show signs of their growth leveling off. As long as you are catching fat, healthy fish, let them grow. But, once you begin to see certain size classes obviously reaching a level growth plane and begin to lose some weight, those are the ones to harvest. Typically, in southeastern Nebraska, I would expect to begin harvesting some fish late in the third or in the fourth year. There are a couple of exceptions. When your crappie are big enough, take them...I would suggest that magical 12-14" size, where they already are. Another exception is your catfish. They taste best when less than three pounds. Better texture and better flavor. Besides, you can buy 10-12" channel cat for very little, to replace those you catch.



*Here's Fred's pond, full to the brim.*

# The Best Homemade Salsa Ever

by Bob Lusk

Almost every time we have company at LL,2, our guests love to dig into some homemade dips. I have one that takes just a few minutes to make and everyone loves it. It's a simple salsa. I was strolling through the Texas State Fair a few years ago in Dallas, and came across one of these sales guys...you know who I am talking about. They have on a headset, apron, knives and stuff, chopping every vegetable on the planet and turning it into the best food you every saw. Well, this guy had this handy-dandy little whirligig of a machine that you put stuff in, turn the handle, and out comes a meal. I was fascinated. I just happened to have a crisp \$20 bill in my pocket and that was exactly what he wanted. We traded. I had that thing about a year and our house burned down. I missed that little machine. We looked everywhere, couldn't remember the name of it and couldn't find another one like it. Then, I went to a hunting and fishing show. There, on the middle aisle, selling the same machine...a different guy. I whipped out a \$20 bill, asking no questions. He gave me \$8.00 change. Hmmm...enjoy the recipe, our guests certainly do.

This salsa is good as a stand alone dip, also as a garnish on grilled pork, chicken or fish. Some people enjoy jalapeno pepper to give the dish a little 'bite' but you don't have to, if you don't want to. Oh, yes, there's two ways to handle the jalapeno...remove the seeds if you want the pepper flavor. Or, leave the seeds in, if you want to lose your lips and tonsils.

In your handy-dandy food chopper/spinner/thingy, cut up:

5 medium Roma tomatoes (they have less juice)

1 medium onion or 6 green onions or both

3 medium tomatillos (green tomatoes)

4 large cloves of garlic (chopped)

3 sprigs of cilantro (to taste)

1 jalapeno pepper (if you want)

Add

1 can tomato sauce

Salt to taste

A dash of Mrs. Dash (if you wish)

Chop it in your handy-dandy food chopper to the consistency you want.

Taste it. It's not against the rules to add anything to it you want. I usually add more salt. I've even added oregano. Oh, and before I forget, it tastes better the second day, and even better the third.

Grab some chips and friends and eat the stuff. We usually eat all of it while we cook.

Here's another tip. Buy three semi-soft avocados, peel and put into a bowl, sans the seed. Add three or four spoons of your salsa, mash, smash, stir and mix and presto-change-o you have guacamole, too. Two dips at the same time. You will be someone's hero.



*Top: This is the best gadget on the planet to make salsa. It doesn't puree it, but leaves some chunks. Bottom: Here's what the handy-dandy little chopper thingy looks like. It's my favorite kitchen tool.*

## Wildlife at Large

*continued from page 8*

weather permits) and he had plenty of birds left in January.

### Waterfowl

Waterfowl visitation to the plains regions is dependant on annual migration status and fluctuating water levels of prairie potholes, lakes and reservoirs. Thus, Shawn concentrated on hosting numbers of migrating birds by providing refuge and food sources that are safely attainable from pond or lake sites.

Shawn put substantial effort into providing the right food, water and cover, at the right time and place for each target species. The fruit of his labor is a net abundance of game within well-established habitat. In a short time, he has indeed succeeded at creating an attractive diversion for wildlife from the vast monocultural landscape that surrounds his management areas.

During our field hunts, we found most of the pheasants and all of the quail within dense cover strips and mature food plots. It was not uncommon to flush 15 to 20 pheasant at a time in his designated bird areas. I was convinced the deal was working when we watched them fly out of sight and return for a repeat performance the next morning.

At any given time we saw a variety of deer, thousands of migrating ducks and geese, and hundreds of upland birds & doves. Shawn's father-in-law, Jimmy (formerly an intense management skeptic), told me that "deer tracks made the paper not that long ago; now we see 10 does/fawns and 6-8 bucks at the feeder each evening."

Shawn Svob has done a great job demonstrating you don't need thousands of high-fenced acres or a pocketful of money to produce wildlife. Like many of us, he could have been discouraged by the size and isolation of his property but instead used an "oasis approach" to draw wildlife in. He is definitely taking positive advantage of local farm field game production by altering natural distribution and concentrating populations in his habitat.

Maybe Shawn heard my age-old sermon on "feed them and they will come" and put game populations where he wanted them, when he wanted them there?

*Dan VanSchaik is a nationally known, well respected private sector wildlife biologist. He can be reached at danv@texoma.net.*



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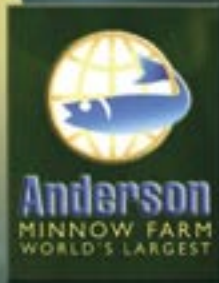
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# Winter Aeration Research

By Dr. Dave Willis



Some of you read Pond Boss for fun, some for technical information, and I suspect most of you read it for both! Let me update you on a research project in progress. Many of you may find the “set-up” interesting and thought-provoking, and we’ll have the graduate student provide an update for the magazine after the project is complete.

In keeping with the theme for this issue of Pond Boss, let me update you regarding some winter aeration research ongoing right

now. South Dakota State University graduate students Andy Jansen and Dan Spengler are heading up this project, with help from Dr. Mike Brown.

The set-up, or need, for this research project actually started with discussions on the Pond Boss website discussion forum. Historic advice has been to put the airstone for a winter aeration system in the North Country on the bottom of a pond in the deepest water.

As many readers know, water is most dense at 39° F. Thus, water on the bottom of a pond is actually warmest during the winter, and it cools as you move toward surface ice (32° F). Air bubbles from a winter aeration system lift some of that warmer bottom water toward the surface, which helps keep an open hole in the ice. Sunlight penetration is high at that location, and algae and plants in the water then can keep providing oxygen to the pond. Other good things can happen, including release of toxic chemicals such as methane. Take a look back at Mike Mitchell’s article on this topic in the last issue of Pond Boss (Volume XIV, Number 2, pages 28-29).

Over the last year our two, discussions on the Pond Boss website forum led us to believe that placing the airstone on the pond bottom may not be our best strategy.

Depending on the volume of water circulated by the aeration system, concern arose about “super-cooling.” The concern with super-cooling is that by circulating too much of the water volume of a pond, we may actually be lifting so much of that 39° F water off the bottom that too much cooling occurs as it swings past the ice at the top of the pond. Fishes in the North Country are adapted to living with relatively warm water at the pond bottom, at least if you can call 39° F warm. If the warmest temperature at the pond bottom

drops substantially below 39° F for long periods of time, it may actually be deleterious to the fish, perhaps even to the point of winterkill. The likelihood of winterkill probably depends on duration of time for the reduced temperature, and amount of dissolved oxygen present in the pond waters.

To try to get a better handle on this issue, we are monitoring temperature, light, and dissolved oxygen in two ponds that have windmill-type aerators. The windmills were our only original choice for these ponds because of a lack of electrical service.

---

**If the warmest temperature at the pond bottom drops substantially below 39° F for long periods of time, it may actually be deleterious to the fish, perhaps even to the point of winterkill.**

---

Andy and his crew are monitoring temperature and light with scientific logging devices. These loggers record a light and temperature reading every four hours. Andy and Dan placed the loggers in the pond last fall, and will pull them out next spring. All that information is then downloaded to a computer.

The loggers were suspended on a rope at three locations: just above the pond bottom, in the middle of the water column, and then near the surface and hopefully just under the



*Andy Jansen stands in front of the float holding the suspended meters.*

*Note the water rising from the aerator just to the right of the float.*



*Right: Dan Spengler holds a line with temperature and light loggers suspended near the pond bottom, middle, and surface. The cinder block is just below the lowermost logger and the float is above the upper logger.*

ice. Andy will also collect dissolved oxygen profiles (that is, from bottom up to the top) over the course of the winter. He'll also take light measurements at those depths, as we expect periphyton (algae that grows on surfaces) to grow on the submerged light meters, and we'll thus be able to correct the logger measurements if we know how much light is present as the winter progresses.

Dan's other research study involves sex hormones (estradiol) in fish, and he also is collecting blood samples so he can study bass reproduction in these ponds. One pond has largemouth bass, and the other has smallmouth bass. At regular intervals, Dan and his associates are collecting bass by ice fishing to obtain blood samples.

Readers who ice fish in the North Country probably realize largemouth bass do not always bite well in the winter. Smallmouths are much more cooperative, at least much of the time. Well, Dan found that exact combination. Sampling 10 largemouth bass in January turned

*continued on page 72*

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## Waterfalls Will Work

By Bob Lusk

**M**ini-ponds need aeration, too. Just because this issue of the magazine is focused on aerating ponds, let's don't leave out the little guys.

Actually, mini-ponds need aeration more than the big boys.

Fact: The smaller the pond, the more likely there will be water quality issues. Face it, we try to force our smaller ponds to be more than they should be. We tend to

over-feed, under-fish and push, push and push.

We plant, we mow, we enjoy. But, way too often, we grow to ignore the smaller ponds because we tend to set them up to fail.

Here's an idea to improve their chances for success.

In order to come up with a game plan, we need to know the "problem" that needs

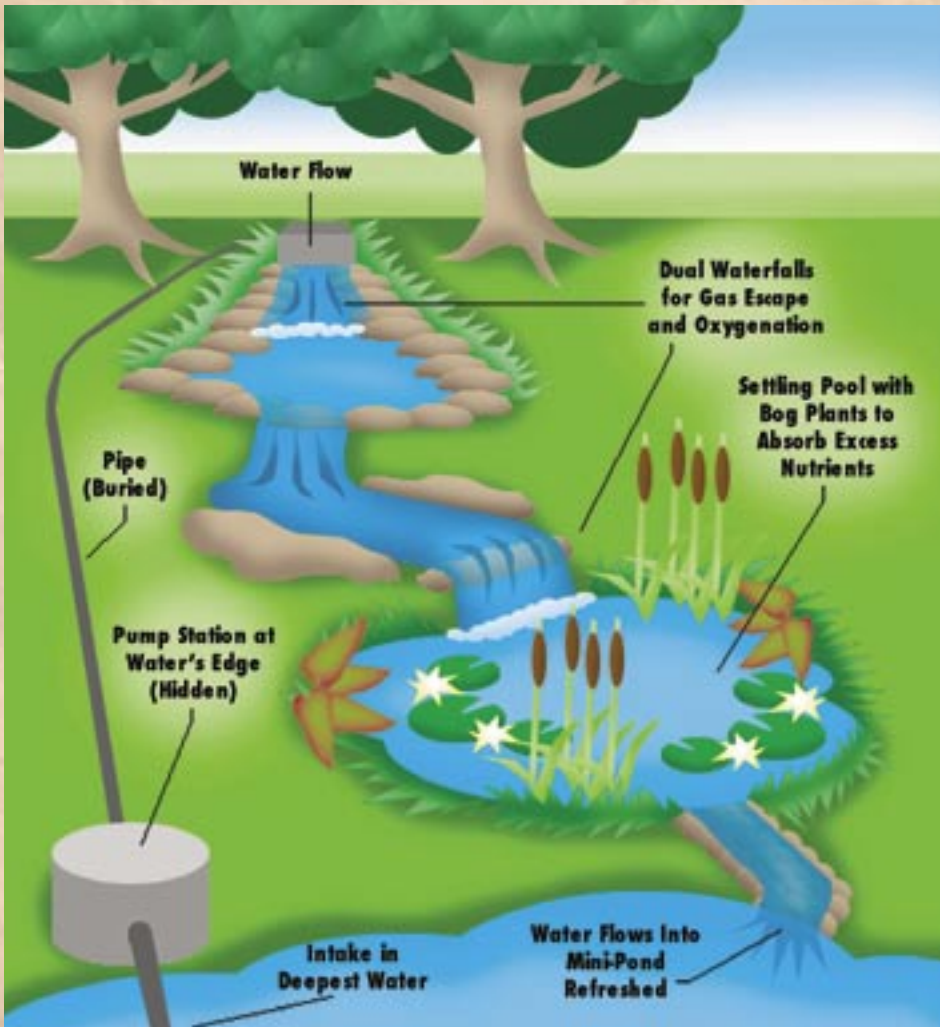
solving. In a typical mini-pond, the water is shallow, fish go through typical stresses and the water deteriorates way too fast because there are usually too many fish and too many waste materials present.

How to fix it?

Build a waterfall aeration system which doubles as a biological filter. Pump water from the deepest part of the pond to the top of your natural looking waterfall, let the water cascade over a wide rock platform and roll into a wide pool below before it winds down a rocky "creek" bottom back into the pond, fresher than ever.

Biologically, here's what happens. When you pump the deepest water, you are moving the nastiest wastes, both suspended and dissolved, from the entire pond. When fish breathe and metabolize their food, what leaves their bodies is heavier than water. It sinks. Over time, this stuff, along with all the other organic stuff such as tree leaves, air borne detritus, and grass clipping, collects and fills the pond from the bottom up. But, when you pump it up and over a waterfall, Mother Nature is allowed to do her magic. First, when that water hits the air, some gasses are allowed to escape. That begins the cleansing process. As the water flows over rocks and falls downward, it contacts more air, providing fresh oxygen to absorb. When the water goes into the pool, be sure the wet stuff passes through a healthy stand of beautiful rooted plants, especially bog plants. As the water flows, plants take up excess minerals and nutrients, primarily ammonia, nitrogen and phosphorus.

A properly designed waterfall can efficiently aerate and filter your water. For a mini-pond, that attractive combination of water movement and filtration can be significant enough to allow you to keep pushing the limits.



Example of a waterfall aeration system that will double as a biological filter.



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# Wood Ducks on a Bass Lake

*by Bob McFarland*

For many of us the primary focus of our lake is growing big bass, but providing nesting boxes for wood ducks can be a very rewarding complement. In winter months when bass are in deep water waiting for spring, wood ducks are pairing off, selecting nesting sites, laying eggs, and hatching ducklings. All of these activities are fun to watch.

While we see many different species of ducks at our lake in Northeast Texas, wood ducks get most of our attention. They are among nature's most beautiful ducks, and they are one of the few ducks that will choose to nest in our area. Woodies are the only duck in North America that will raise two broods per year. Each year we have a few hens that will endure the heat of the Texas summer to hatch a second batch of ducklings in July or August.

Wood ducks like corn. If you have automatic feeders that throw pellets for the bass during warm months, they are perfect for throwing corn at the edge of the lake for ducks during winter. As the sun is setting on a late winter evening, we may get 100 wood ducks coming to the lake to eat corn along the shore line.

We have three solar powered directional feeders on our six acre lake. One of the feeders throws corn for the ducks and other critters all year. Another feeder throws pellets for the fish all year. The third feeder throws corn in the winter when the duck population is high and pellets for the fish in the warmer months.

Female wood ducks tend to return to the area where they were hatched, so once a wood duck population starts, the numbers build rapidly year to year. When we put up our first box, it took two years for a wood duck hen to successfully hatch her eggs. Now we have five boxes, and all are filled every year.

In January, the ducks start to pair off. The female leads the way for a tour of possible nesting sites with the male behind her. The

male is continually talking to her and will occasionally nibble on her neck. While the male waits in the water below, the female will fly into a duck box, spend a few minutes there, and then return to the water to continue the tour. When she finds the box that is just right, she frequently spends some time sitting on top of it.

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**Female wood ducks tend to return to the area where they were hatched, so once a wood duck population starts, the numbers build rapidly year to year.**

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At our lake the egg laying starts in February. Typically, a hen will lay one egg per day until she has a clutch of 10-15 eggs. Then she moves into the box full time to sit on the eggs with

only brief breaks for food and water. A few days into the incubation process the male leaves, and mama duck does everything else on her own. Our experience is that 80-90% of the eggs will hatch with an incubation period of 24-28 days.

Once you have wood ducks nesting on your lake, you may be lucky enough to see "jump day," one of the most entertaining events in nature. When the baby wood ducks are only one day old, mama duck sits below the box and calls to them. One by one these balls of fluff jump out of the box with their stubby little wings flapping.

When all of the ducklings are out of the box, mama leads the parade to the safety of open water and then to a wooded or brushy area of the lake that offers protection. She will stay with the ducklings for the next month until they can fly on their own.

Along the way we have learned some lessons about wood duck boxes. We mounted our first duck box on a tree that we left standing in the lake. In the fall when we opened the box to clean it, I found myself eyeball to eyeball with two 5 foot water moccasins. When you are standing in the bow of a jon boat with your



*Wood ducks at sunset.*

nose a few inches away from two big snakes, you are inspired to find another way to mount the boxes.

We now mount our wood duck boxes on metal posts. We use 8 foot U-posts (available at Lowe's). We drive one post in the ground along the shore and bolt a second U post to it. Then we slip a piece of 4 inch diameter PVC pipe over the second post. The PVC provides a slick barrier that keeps raccoons and snakes from getting into the box. We put car wax on the PVC pipe to make it extra slick.

The wood duck box in the photo is on an especially windy piece of shoreline. We have stabilized it by screwing two anchors into the ground and attaching them to screws in the sides of the box. To attach the box to the anchors we use 210 lb test Surfion nylon coated stainless steel leader (available at [www.4fishin.com](http://www.4fishin.com)).

You can take your wood duck experience to the next level by installing a video camera in the box. If you can put a wood duck box within 1000 feet of an electrical outlet, you are a candidate for an in-box camera. You will see mama wood duck prepare her nest, lay the eggs, and incubate them.

When you see that the eggs have hatched, you know that the next day will be jump day. On jump day you will get your cup of coffee

and video camera and find a good spot to enjoy an unforgettable experience. Take a pair of binoculars so that you can enjoy the show from a distance. The jump usually starts between 7 and 10 am. I like to be there at daylight.

We have had good luck with the Hawk Eye Nature camera (available at [www.birdhousespycam.com](http://www.birdhousespycam.com)). The camera comes with 100 feet of cable, and 100 foot extensions are available. We mount the camera in a Coveside wood duck box (available at [www.coveside.com](http://www.coveside.com)). The larger Coveside box has ample room for the camera and a door that opens from the side making it easier to install the camera. It also has an internal ladder to help the baby ducks climb out of the box. We hook the cable to the cheapest 14" TV that WalMart sells, and the results have been excellent.

A good source of practical knowledge is the Wood Duck Society ([www.woodducksociety.com](http://www.woodducksociety.com)). For an annual fee of \$10 you can join the Society and get their Newsgram that has tips and photos on the management of nest boxes. The web site also has a link to good amateur video of jump day.

As you plan your projects for the year, consider investing a modest amount of energy in wood ducks. It will be well rewarded. They are likely to become a treasured part of your daily



*Family affair--daughter Leslie and grandson J.J. enjoy the beauty of wood ducks.*

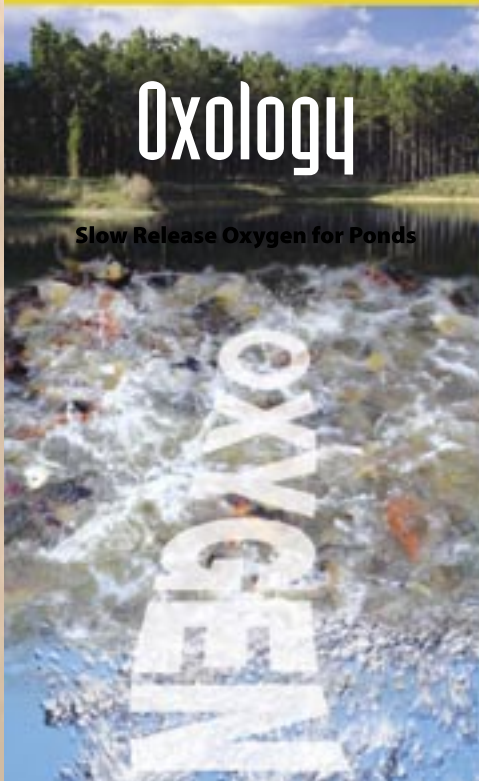
winter routine. And if you are lucky enough to witness jump day, it will be an experience you will never forget.



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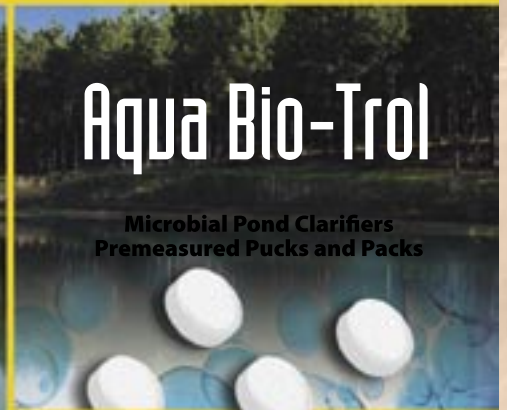
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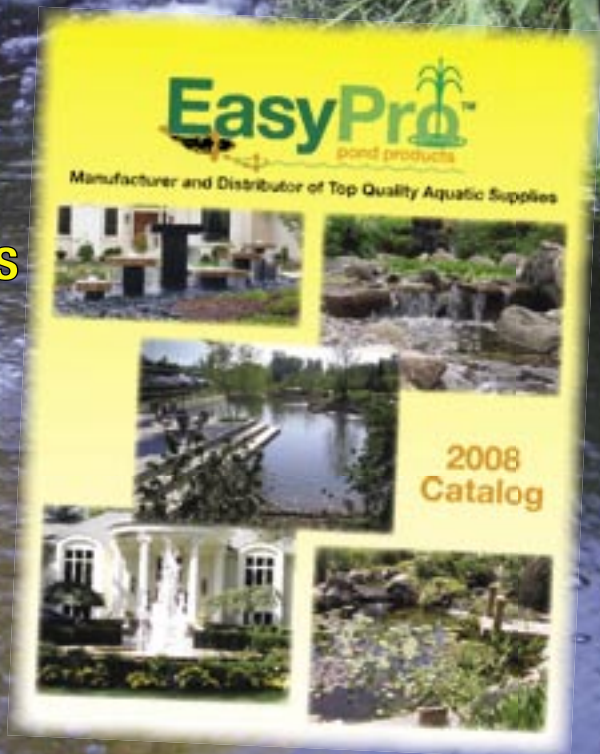
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# Kids Fishing. Events Are Good. Places Are Better!

*by Michael J. Mitchell*

There has always been a mystical connection between kids and fishing. It's a combination as natural as mothers and soft touches, rain and tall grass and sunshine and bright flowers. When the connection is made, it is made for life. I like to call it one of life's most accepted reversion opportunities. Think of it, as children we work to learn to fish better to impress those around us how grown up we are, yet as adults we fish to provide us that place where we can go and act as children. If you don't believe me...watch the BassMaster's Classic and tell me how you would describe the behavior of competitors when they win. Heck, you ought to see me every time I hook a nice walleye or release a great trout. It's a thrill.

Kids and fishing go together. Many educators will tell you fishing is often a child's first contact with the natural world...a contact upon which a lifetime of conservation ethic can be built. None of us pondmeisters would argue that. Each and every one of us has taken those early experiences in our lives to the extreme of avocation and vocation. Water, fish, and fish habitat; heck they occupy an inordinate (our spouses might even say perverse) amount of our time. We wouldn't have it any other way.

Kid's today, for a multitude of reasons, do not participate in fishing like previous generations did. One significant reason I have found is pure and simple "lack of opportunity." I don't mean there is no water where they can fish. I don't mean that there are no programs that teach the "academics" of fishing. I mean there are not enough places for kids to go where they can actually catch fish. And even fewer where they can return, on their own, and continue to

catch fish. This is extremely important if we are trying to nurture a love of fishing.

In my hometown of Longmont, Colorado, we sought to change that. We looked at our effort differently. We didn't want to create kid's fishing events but instead we chose to create a kid's fish place. One they could go to anytime they wanted and expect to catch fish. I was convinced that if we built it they would come.

As we approach another Spring, when our thoughts turn to warm days and favorite fishing places, I would like to share some of our experiences creating a kid's place to fish in hopes that it might motivate or help you do the same. The first realization you have to accept is...that if you don't do it, it won't get done! This is not intended to be a condemnation of the masses but rather a baptismal of the willing.

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Most successful kids fishing programs have a few essential elements. Start with an aesthetic place to fish that holds fish year round. Ponds and lakes work great. Find an aquatic resource that is not too small so you can support good numbers of kids (> 2 acres) or too big so that it becomes too expensive to stock with adequate numbers of fish (<20 acres). I like

ponds that are just deep enough to over winter fish (for Colorado that's 15') in the 5-15 acre category. This provides a pond that supports a self propagating fishery, like largemouth bass, as well as lots of room for seasonal stocking of fish (like rainbow trout).

When I went looking for a pond to use I examined my hometown's park system and found ponds the right size, then looked at their other attributes. A good kids fishing pond should have nice shoreline development to accommodate shore anglers and be close to the kids so they can walk, roller skate, skateboard or ride bikes to it. I also looked for vehicle parking with short walking distances for parents, reasonable fishery management to keep the fishery intact (yup- I provide that!), regular fish stocking with species that kids can catch (catfish, bluegills, largemouth bass and trout-to name a few), and partners that are willing to help fund and run the program. Most towns and cities have these kinds of ponds somewhere in their parks systems. Cash strapped municipal parks systems seek out partners to help them fund and manage their parks. The fit can be very good.

The partners are the hard part. Start with a small group of volunteers, say two or three people and define what kind of partners you need. To motivate partners it's essential to give them a purpose for participation. We choose to do this a couple of ways. First we decided to dedicate the program to a dear friend, local business leader and fellow angler. We tried to make a natural match of the person with the program. He was thrilled by the honor assisting us to create the program. Next, our

team decided we wanted the program to not just provide a long-term place for kids to fish but to also include the senior component of our community. We wanted to provide an opportunity for seniors and kids to interact. We went to the retirement community starting with community leaders like successful insurance brokers, bankers, and retired business owners. People whose vocations provided them with a long history of face time with the community. This group of volunteers we call our “fishing hosts.” They help raise funds and have been trained to feed the fish in the lake. They carry cell phones in case there is a need for emergency services and they help children (and parents!!!) with fishing equipment. We have a number of senior volunteers that show up every day. Many carry in their pockets, often at their own cost, just the right lure to catch fish. A generous, local restaurateur was so impressed with our fishing hosts that he gives us certificates for free dinners to hand out to volunteers and their spouses. The dynamics of the human spirit that you get to watch are incredible.

Another important element you need is enforceable rules. The first rule must totally restrict all fishing to kids 15 years and younger. If you don't do this adult anglers (Parents even!) will show up and clean the lake out every time you stock it. This is no news to pondmeisters but believe it or not, our hometown paper chose to write an editorial condemning the program because adult fishing was excluded. Sheeesh! It took us two years to eliminate adult trespass on the lake. Also, if you allow the over-15 year old kids to fish they figure out all the best places to fish and keep the younger kids out. Another important rule is to allow the kids to keep, if they desire, whatever they catch. Fishing and providing fish for the table is an important character builder for young children in a family setting. I was severely pressured to make it a catch and release experience for the kids and start teaching this ethic. It was pointed out to me that if we allowed fish to be harvested perhaps we would attract kids from families in town that needed the fish for food. All I could say was... Duhhhhhhhh!!! I suggested that we could provide a “piscine offset” for the kids by releasing all the fish we catch. Come on now, there is plenty of time in an anglers experience to adopt the very real benefits of catch and release. You have to let kids be kids if it is truly to be a kid's place. Just be sure if they keep a fish, they clean it.

We built it and they did come. Tiny “anglers to be” to the tune of thousands each year. The Charles “Chick” Clark fishing program is now 5 years old. We keep the program simple: provide a place and provide fish for kids to catch. We stock the lake and hold our “Kick Off” event



*Help for the program comes from many places. Here the local Girl Scouts donated a wagon for Fishing Hosts to transport feed during their daily fish feeding activities.*



*A small team of effective volunteers should include community leaders and those that supply the pond or lake you would like to use.*

the weekend before spring break to give kids something to do over break. Our local Breakfast Optimists provide annual donations for stocking fish and they now fund and serve free hotdogs and pop for our “kick off” event each year. In 2007 they handed out 900 hot dogs in one day!

Since the program was established our state game and fish, local council of the Boy Scouts of America, and many local fishing clubs and organizations hold annual fishing clinics. They teach fishing knowing that there are fish there for kids to catch. They hand out hundreds of

free rods. Local fish hatcheries donate and sell fish, the state game and fish stocks fish and local fishing stores help with funding and education clinics. All of this happens, because now there is a place for kids to catch fish in our town...one we like to say that they can call their own.

*Mike Mitchell is Senior Aquatic Biologist for Queen of the River Fisheries, based in Longmont, Colorado.*



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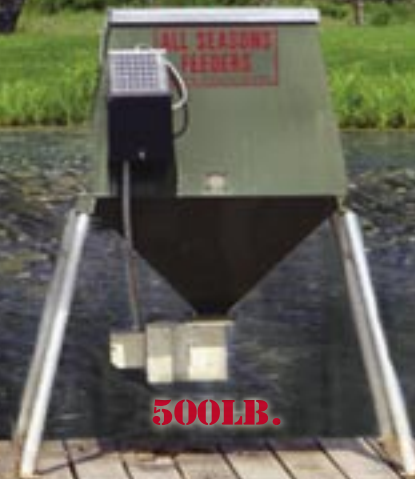


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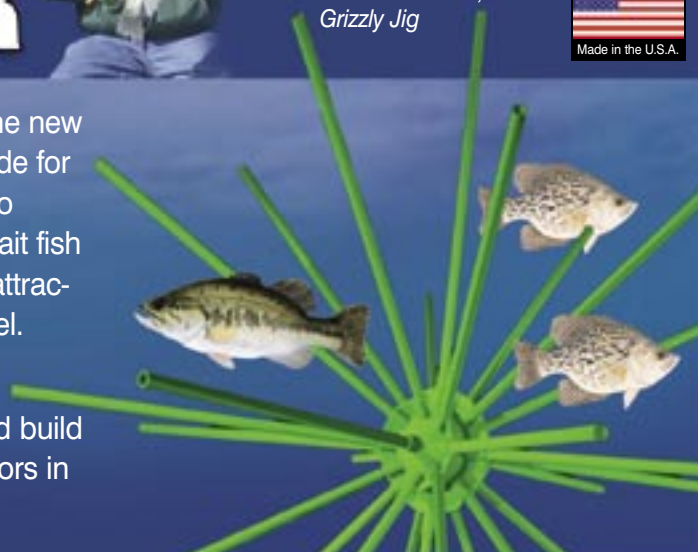
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## Stomach Pumping... What Are Your Fish Eating?

*By Mark Cornwell*



Every year in one of my fisheries courses students perform diet analysis on several types of fish from a local pond we are studying. I usually introduce the topic by asking the class “How many of you have ever had a stomach lavage?” Not a single hand goes up. Then I ask, “Have any of you ever had your stomach pumped?” Not surprisingly, at least one person in a class of 15-20 will usually raise a hand. I won’t take you into some of the stories and details that follow...you get the idea. We hear this on hospital TV shows like ER when a doctor says “Give me a gastric lavage...stat.”

To find out what your fish are eating, let’s bring the fish ER pondside.

Stomach pumping suggests that we take a suction pump, like a vacuum, and suck out the contents of the fish’s stomach so that we can see what it is eating. The opposite is true. A lavage is stomach flushing, which is what we are doing here. Taking water and forcing it into a fish stomach washes out what the fish had for dinner.

I was first introduced to this technique as a kid fishing for trout on the banks of the Delaware River. Every nice sunny day, a group of wise, sage (which actually means “over 75 years old”) fly fishermen would sit on the grassy bank of the river discussing the “hatch.” Every once in a while one of those geezers would make it off the

bank and catch a trout. They gingerly kept the fish in the water in the landing net and guided it to the bank. One man held the fish in the net and another reached into his vest and whipped out what looked like a modified turkey baster, with a thin tube protruding off the end. He filled it with river water, guided the tube gently down the trout’s throat, squeezed the baster bulb, and out came fish lunch, which usually included a myriad of mayflies, stoneflies, caddisflies and an occasional sculpin or baby trout! Baby trout! Cannibalism! Light bulbs went off in my 12 year old brain, firing up all kinds of new ways to catch these wary trout.

If you want to build a stomach “pump” to

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**One man held the fish  
in the net and another  
reached into his vest and  
whipped out what looked  
like a modified turkey  
baster, with a thin tube  
protruding  
off the end.**

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*It’s fun to figure out what a fish ate. This partially digested crawfish is living, er dead, proof of what some fish eat.*

A lavage is probably a more appropriate term when we talk about this technique.

check your fish and match your “hatch,” here’s how. Building four or five is as easy as building one of them. I tend to lose things. If you have only one, you’ll never be able to find it when you want to use it. The first thing you need is a large syringe (I’ve moved past the turkey baster). Your local veterinarian will have some of these and so will your local friendly farmer. Horse people should have a bunch of them, too. Sometimes farm folk throw them out, you may need to ask a few people to save them for you. Make sure the syringe holds at least 75-100cc. I like even bigger ones if you can find them. If you can’t find one, get your hands on a vet catalog or go online and order one. Barter for a few of them and get started.

Take that syringe down to a hardware store and look at their inventory of tubing. Tubing usually comes on large rolls. If you don’t see it, ask. Most good hardware stores will have some. Buy the size that fits best on the end of the syringe. A few feet of the tubing is plenty. I usually make two sizes of these pumps, one for small fish like panfish, using aquarium airline tubing (3/16” outside diameter) and then a larger one using bigger tubing for bass. As you shop for tubing, bend and twist it. Some tubing is more rigid than others. You don’t want it to be too flexible, like wet spaghetti, but not rigid like a straw either. You want something flexible enough to snake down a fish’s throat and not puncture its gut. For small fish, the length of tube attached to the syringe can be six inches or so in length. I have found that the perfect tubing is a bit aged, not brittle and still a little pliable. Make sure there are no sharp surfaces on the tubing from your cuts.

As you learn, practice on fish that aren’t your favorites. I will get to problems in a minute. Personally, being a fisheries biologist and teacher, I like to anesthetize fish, first. It is easier on them and you. If you want to knock them out first, I would do it with Finquel (MS-222) or with a few drops of clove oil (from the health food store) emulsified in a little bit of ethanol. But, practically, most pondmeisters don’t need to knock them out.

To flush the stomach, like the stream-side old timers with the turkey baster, it’s best to use two people. One person controls the fish and the other one runs the syringe. Fill the syringe full of clean water. Hold the syringe pointing up and push the plunger a bit to get out any extra air (again, similar to those TV shows, where someone is about to get a scary shot and the doctor is squirting some unknown fluid into the air from a needle). Have the fish handler open the fish’s mouth. Now, this is the most critical part...the syringe man then looks down the fish’s mouth and guides the tubing



*Tilt the fish up, insert the tube. Make sure fish handler’s hands are wet.*



*Once the tube is inserted, tilt the fish downward and push the plunger. Be sure to hold the fish over a container to catch the contents as they flow out.*



*This small sunfish came from the stomach of a bass.*

exactly down the throat of the fish.

**DANGER!** Be careful not to push the tubing out the gills, or too far down the stomach! You will encounter a little resistance just before the tubing slides into the stomach, but do not use excessive force. The fish's throat has a tight muscle at the top. Fish stomachs are a bit elastic, but don't push the tubing in too far. Once you are "in" (after a few practices, you will get the feel) the fish handler should angle the fish mouth down, tail up, with the mouth over a tray or plastic bag to catch stomach contents. Now, syringe person...push that plunger! In an ideal world, water will be forced into the stomach and contents will be flushed out the throat. I like to

move the syringe in and out a little (1 inch?), keeping the tubing end in the stomach to give a bit of room for contents to get by the tubing on the way out. As you push the water inside the fish you should feel the stomach swell like a water balloon, then collapse as the water exits. Flush the stomach at least twice. After pumping, look down the throat and see if anything is lodged in there. You may see something (like a fish tail or crawfish) that can be easily grabbed with a set of tweezers or even fine needle nose pliers.

Foster (1977) documented that this technique (when done properly) is almost 100% effective at removing stomach contents. In his study, stomachs were dissected after pumping to prove effectiveness. Really big fish are harder to do. You are limited by the size of the syringe and the tubing. A large bass will take several 100cc syringes in his stomach and not regurgitate anything. Not good. In this case, you need a larger syringe system (or even small water pump) and a tube approaching the size of a garden hose. My recommendation to you is do not do this with your large bass. Stick with bass less than 15" with this technique.

Have I killed fish doing this? Yes. How? The most common error, especially with rookies,

is missing the esophagus on tube insertion and hitting a gill, causing a fatal bleed. I have also blown out a few stomachs by forcing the syringe plunger too hard. There's no need to jet the water in. The more you do it the better you get at it.

I teach kids who have never held a fish before to do this all the time in our field work. After doing just a few fish, their confidence greatly improves. Yours will too. I have never met a fisherman who was not interested in what his quarry was eating. Kids love this stuff. Their first reaction to fish puke is usually, "Yuck!" then they move closer and look at it, "Awe that's gross!" then "Cool! Can we do it again?"

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*Mark Cornwell is a fisheries professor at SUNY-Cobleskill in Cobleskill, New York. His passion is raising walleye and the I.Q. of fisheries students in the Northeast. Reach him at CORNWEMD@Cobleskill.edu.*



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## Aerate This...

By Bob Lusk

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**As the industry has blossomed, so have the gadgets and devices.**

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Remember, way back when, maybe the 60's, when a revolutionary new book came out called, "Everything You Ever Wanted to Know About..." Remember?

Well, here we are, again. With one little difference. This section of this issue of Pond Boss is dedicated to everything you ever wanted to know (or maybe didn't even know you wanted to know) about pond aeration.

As a long time fisheries biologist, it's been fun to watch the pond management industry bloom, so to speak.

As the industry has blossomed, so have the gadgets and devices. People's passions to care for their water and the creatures that live in its depths have fueled the need for new inventions and conversions. Heck, just 15 years ago,

aerating ponds wasn't cool. But, every sewer treatment plant on the planet had some sort of spinning, blowing, pumping device to clean that water to local, state and federal standards so it could be sent down the creek for the next city to drink.

Some of those devices made the common sense transition to pond management. At the same time, crafty entrepreneurs and thoughtful engineers cranked up their brains and started inventing.

Consumers went from buying a sump pump at the local hardware store, setting it in a plastic bucket on the bottom of the pond, plugging it in and shooting water out a pvc pipe to fountains to air pumps pushing big volumes of low pressure air to circulators. Now, we have all kinds of

choices, based on our need and discernment.

As you read and enjoy the following pages, keep in mind the old Latin phrase, "Caveat emptor"...let the buyer beware. However, I have a caveat of my own. We won't let anyone advertise or write in this magazine who isn't an expert at what they do. You can go to the bank knowing each of these writers, as well as their products, are above reproach.

Your job is to study, ask questions, absorb what you learn and make the best choice as to which device, or combination of these tools, suits your lake or pond the best.

So, step into the parlor and enjoy the heck out of all this good stuff about aerating your pond.



*Left: The Lake Life Pump, in action. It draws water from almost two feet deep and gently pushes it downward, into the depths. Right: A video crew produced the dvd you will find on page 43. Here, Ray Scott prepares for a take. See article on page 42 for more information.*

# Aeration as a Lake Management Tool

By Bob Robinson, Fisheries Biologist, Kasco Marine

**T**HE most important water quality parameter for lakes and ponds is dissolved oxygen. Oxygen is essential to the metabolism of all aerobic (air breathing), aquatic organisms. Oxygen is measured in parts per million (ppm). 5 ppm is like a drop of food coloring in a 55 gallon drum. Five ppm is what I'll term as the threshold to support a healthy aquatic eco-system.

Here are some basics about dissolved oxygen in fresh water:

1) The air we breathe is 20.9% oxygen, the rest is essentially nitrogen.

2) Oxygen concentration is temperature dependent. Warmer water holds less oxygen. And it is in the warmer months when metabolic activity is the greatest in ponds when oxygen demand is typically greatest. Heat is also the reason more oxygen related fish kills are likely to occur during the dog days of summer.

3) Oxygen is affected by: initial dissolved oxygen levels, barometric pressure; water temperature, water purity and elevation.

4) In Nature, oxygen is produced in water by: a) Wind action. b) Diffusion at the air water interface. c) Photosynthesis from aquatic plants.

5) Oxygen levels in your pond's water typically fluctuate throughout the day. During clear, bright days plants utilize the sun's energy to produce oxygen so that peak oxygen levels

occur in late afternoon. Typically, the weather tends to be breezier during mid-day so oxygen exchange at water's surface is also greater. As the sun sets, the winds tend to calm. The same plants that were just producing oxygen reverse themselves and are now consuming it. Typically, in the early morning hours just as the

sun rises, oxygen levels will be at their lowest point of the day.

6) Without oxygen present or with minimal oxygen:

- Ponds can stratify.
- The organic muck layers on the bottom degrade much more slowly.



*Surface aerators were designed first for the fish farming industry. They can also be used to aerate shallow recreational ponds.*

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**Aeration should not be viewed as a panacea for all of your lake issues.**

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# Bob Robinson - Kasco Marine

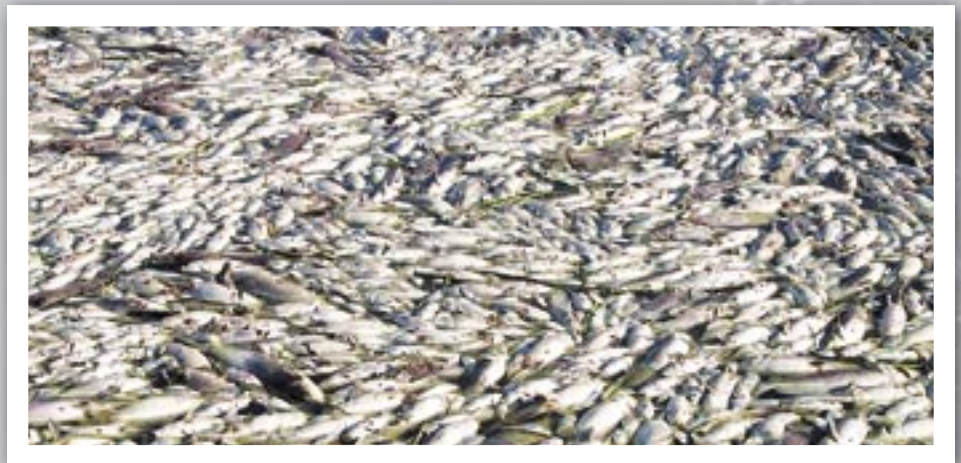


*This fountain adds to the serenity of a pond. Splashing water is aerated as well as beautiful to hear and to see.*

- Phosphorous can stay in solution making it readily available for plant growth.
- Oxygen breathing – sediment consuming organisms can be stressed or die.
- Conditions become favorable for the formulation of harmful gasses like ammonia, hydrogen sulfide and iron.
- The effective living space for fish and many of their food choices is reduced.
- Lakes which contain a large volume of cold, “bad” bottom water are candidates for a “turnover.”

7) During late spring, summer and early fall many lakes become stratified. This is the horizontal layering of water with warmer water at the surface and cooler water on the bottom. Because cold water is denser than warm water, a natural density barrier exists that restricts water movement between the layers. Since most oxygen is produced or enters the water in the top layer it is unable to mix with the colder bottom layer. When these stratified conditions get to an extreme state a couple of things can happen.

- A summer storm which typically is preceded by a few days of calm, cloudy days could cause a turnover. Those calm cloudy days have reduced sunlight which



*This must be one of the largest nightmares a pondowner can endure. With consistent, proper aeration, the odds of a fish kill diminish.*

influences oxygen production from plants. Dissolved oxygen levels in the water tend to drop. Heavy wind action coupled with colder rainwater deepens the possibility of being strong enough and cool enough to mix the entire body of water and cause a fish kill. When the cold, stagnant bottom layer mixes with the healthy warm water on top, the bottom water absorbs much of the oxygen while releasing its harmful gasses. The consequence of this event is a rapid fish kill.

- In fall as water surface temperature drops naturally, it will eventually equal the same temperature as the bottom water. Once the temperatures are equal there will no longer be a density barrier which will allow the whole lake to mix. If the bottom was extremely stratified a fish kill could result just as described above.

So what is a person to do to prevent a fish kill due to low or no oxygen condition?

1) Fertilize carefully as to not cause too strong of a “bloom.” Specifically, bluegreen algae are more susceptible to die offs than more stable green algae. Manage your pond for secchi disc reading of 24” or greater. Managed algae has a dramatic effect on fish as well as water quality and plant species composition. Some people prefer clear water in which they can see

# Special Section - Aeration



*This is what most pondowners want to see. Giant, healthy fish in pristine, clean water. Johnny Graham, outstanding videographer and accomplished angler from Tulsa, Oklahoma holds a bass that weighs beyond nine pounds.*

all the way to the bottom. Clear water is better for a swimming hole than a fishery. Fertilizing correctly results in a more productive pond in terms of carrying capacity expressed in pounds of fish per acre. Keep in mind certain species of bluegreen algae can add to fish off-flavor if you are thinking of eating what you catch.

2) Create a berm and swale around the bank to allow water to be filtered through the soil prior to entering your pond.

3) Try to encourage native vegetation around the perimeter of your pond to assist filtering incoming water.

4) Rooted plants are more stable than algae. Algae come in two forms. Planktonic (those that are typically microscopic but tint the water green) or filamentous which are typically referred to as "moss" or "horsehair." Rooted plants are more stable as they won't die off as fast as algae on cloudy days.

5) If you use grass carp for rooted aquatic

plant control, be careful to not stock too many. Grass carp preferred choices of meals are higher order vascular plants. If stocked too heavily these exotic vegetarians eliminate all vegetation cover in a pond. Those nutrients are then released back into the water column, increasing the fertility and leading to a pea green soup of planktonic algae. Grass carp won't eat planktonic algae. Stocking rates vary by the amount of vegetation and type in your pond as well as length of growing season. Rates from 3-30 fish per acre have been used successfully but depend on many variables. Ask for help on this one.

6) Do not overfeed your fish with fish food. Use a floating extruded feed. Extruded feed has been researched to give your fish the greatest cost per unit gain. It is the most digestible (hence little waste to cause oxygen demand). Extruded feed floats on water's surface. Don't feed more than fish consume within five

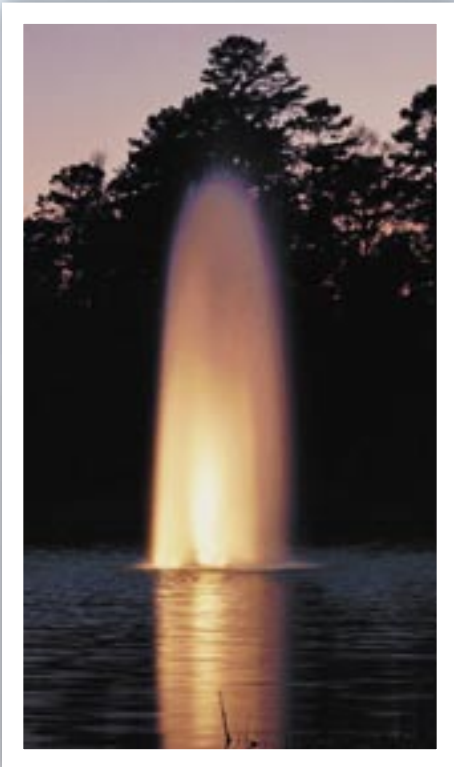
minutes. Uneaten feed drops to the bottom and adds to the oxygen demand of the system.

7) Supplement natural occurring oxygen with an aeration system of some type. There are several types of aeration systems that add oxygen to ponds. No single one of them is going to work for every type lake or pond. Each pond/lake must be viewed as its own individual living system and aeration needs are determined based on the site specific parameters for the body of water and the goals of the pond owner. With a properly designed aeration system you can expect:

- Greater densities of fish can be achieved.
- Spring and fall turnovers can be eliminated.
- Winterkills can be prevented in the northern United States and waterfowl can be protected from bird eating predators.
- Water quality can be improved.
- Organic muck decomposition on the bottom can be accelerated.
- The body of water can be chemically and thermally destratified.
- Circulation currents create more favorable conditions for desirable algae to out-compete blue greens.
- Algae blooms and die offs should be less severe.
- Oxygen insurance for fish you have invested time and money.

For pondmeisters in the Northern part of North America I would be remiss for not mentioning using aeration to prevent winterkill. A combination of thick ice, heavy snow, and a high concentration of decaying plants under the ice is a recipe for fish kills in shallow lakes. Heavy ice and snow cover do not allow sunlight to penetrate water to any significant depth. As a result there is little or no photosynthetic activity to produce oxygen. If this condition is severe enough a fish kill could result because oxygen is used up by decaying plants as well as the living creatures. One solution is to install some type of aerator/circulator that creates a small opening at the surface to allow oxygen to absorb into the water. Colder water holds more oxygen and metabolic activity is at the yearly low so only a small hole is required. An area of maybe 3%

# Bob Robinson - Kasco Marine



*Fountains are decorative and aerate shallow water quite well. At night, they have their own beauty.*

of the surface should be fine. Do not splash the water because that will cool the water and actually thicken the ice. Choices for the right system follow.

## Types of Aeration

There are many different types of methods to artificially introduce oxygen into water. The following are the most common methods.

**Diffused Aeration:** This type of aeration for ponds/lakes employs a compressor, air supply line and some type of diffuser that breaks up the air into smaller bubbles.

### Pros

- One of the most efficient systems for deeper lakes
- No electricity in the Water.
- Gentle rolling action at the surface.
- Excellent destratifier.

### Cons

- Efficiency drops off in water less than eight feet deep. Most bubbles will rise at 1 foot per second and shallow water simply does not have enough contact time to either entrain water to the surface or transfer oxygen as the bubbles rise.
- Compressors require cleaning of air filters; bearings and carbon vanes on some styles need replacing every 12-18 months.
- Some diffusers require periodical cleaning.
- Noise of shore mounted air compressor might be an issue with some landowners.

**Fountains:** These units shall be defined as any device that splashes water into the air to create an aesthetically pleasing display. Keep in mind there is no free lunch. Specifically, the higher the spray the more energy required. Fancy displays require more energy and oxygen transfer rates suffer.

### Pros

- Can have the best of both worlds with some units. Decent oxygen transfer as well as a pretty display.
- Works fairly well in small lakes/ponds that are relatively shallow.
- Very good at venting gasses.

### Cons

- Typically will only draw from the top 10' of depth or shallower.
- Some energy is wasted to create an aesthetically pleasing display.

**Wind Powered aerators/circulators:** Wind power units will either drive a small compressor that pushes air to a diffuser or will be connected to some type of blade or paddle that enters the water and moves as the wind blows. The resultant agitation causes oxygen transfer and water movement.

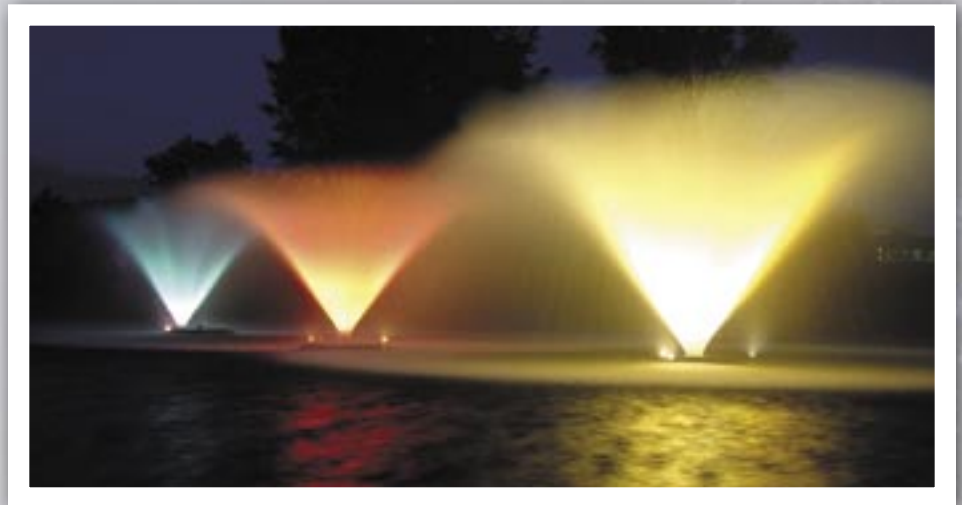
### Pros

- No electricity is required.
- Could be only choice in some remote areas.

### Cons

- Will not work when they are needed most, in no-wind conditions.
- They are not portable.
- Will not work very well on lakes that are sunken in valleys.

**Solar Powered Aerators:** The aeration technique harnesses the energy of the sun and either moves water with blades or supplies



*These "v" shaped fountains, besides adding the soothing sound of falling water, aerate the top two or three feet of this urban lake.*

# Special Section - Aeration

energy for compressors to push air into the water.

## Pros

- No electricity required.
- Could be the only choice in some cases.
- No on-land power source is required.

## Cons

- Relative costs vs. results is extremely high.
- Some are very difficult to install.

**Agitators:** These units employ a float, motor, and prop to splash water at the surface.

## Pros

- Ideal for smaller ponds.
- Fairly decent at Oxygen Transfer.
- Portable and lightweight.

## Cons

- Not very efficient at moving water at depths greater than 8'-10'.

**Horizontal Circulators:** These units can be adjusted underwater to move water in a horizontal pattern to cause circulation. Some also have angle adjustments to get to greater depths. You can position them to point in any direction as well.

## Pros

- Excellent at causing water movement.
- Can be mounted or pointed at variable



*These machines are designed to aerate shallow ponds, primarily for fish hatcheries. Photos for this story compliments of Kasco Marine, Inc.*

water depths to reach and circulate water to 18'.

## Cons

- Not quite as efficient as a surface aerator at adding oxygen but should be viewed as a more effective destratifier.

**Vertical Circulators:** This new device employs an 1800 rpm motor with a gear reduction box that spins a blade vertically (pushes oxygenated surface water down).

## Pros

- Preliminary test results show that 1 horse power will effectively destratify a lake that is 15-20 acres in size to a depth of at least 12'.

## Cons

- Since it is new the jury is still out.

In summary each lake/pond should be viewed as an individual organism. With proper care and precaution you should never have a fish kill. Aeration should not be viewed as a panacea for all of your lake issues. It is one of the tools in the toolbox. Make sure you purchase the right system for your pond and review the following before your purchase:

- Safety.
- Lead-time from manufacturer.
- Dependability of the product as well as warranty.
- Minimal maintenance.
- Technical support pre- and post purchase.
- Simple operation and installation.
- Cost- both initial and operational which includes electrical power, maintenance and replacement parts.
- How long has the manufacturer been in business?



*Kasco Marine, Inc. has been in business 40+ years. The founder, a self-professed "river curmudgeon" owned and operated a marina. He wanted wet storage for winter so he wouldn't have to take boats off the water. He invented the first product, a de-icer, designed to move water enough to keep docks and boats from freezing in Minnesota and Wisconsin winter water. About 20 years ago, Kasco Marine, Inc saw a new need. Aquaculture, the farming of fish, was having growing pains with water quality. Kasco engineers designed a line of efficient pond aerators for fish farmers, devices used to this day. Then, about two years later, Kasco started manufacturing decorative fountains. That business has filled a much needed niche. The company has proven to be light on its feet, ready to shift gears as the pond management industry matures. Now, they are working with B.A.S.S. founder and the "Father of Bass Fishing," Ray Scott, to manufacture and sell Scott's invention, the "Lake Life Pump."*

*Bob Robinson, Fisheries Biologist, Kasco Marine, bob.r@kascomarine.com*



## Fountains



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# Pushing Water Down Lake Life Pump

By Bob Lusk

I will never forget that boiling hot July day. Ray Scott invited me to swing by and take a look at his lake. He was a gracious host, inviting me to stay, next to his house in the "Presidential Cabin" where both Presidents Bush had slept.

We spent time in his office, talking about his life and some of the fascinating stories of the history of B.A.S.S. I was amazed. He seemed almost as amazed listening to my yarns about fisheries biology and pond management. Before long, we were talking about ponds and lakes. He told me the story about a fish kill at his first lake.

Here we were, in his office, and the father of bass fishing was near tears about the death of his favorite fish...20 years ago!

With help from several of his long time biologist friends, Scott concluded his water quality deteriorated over several years. In the midst of a hot summer, with two or three cloudy days followed by a violent rainstorm, his lake had "turned over," resulting in a major fish kill.

He decided to never, ever have that problem again.

That's when he invented the Lake Life Pump.

The first one, a crude device that resembled a horizontal industrial fan under the water was surrounded by a round, welded wire cage, blade spinning slowly, pushing water.

Fast forward to 2000.

Scott was trying to convince me this device keeps his entire lake alive. Here we were, on the shores of the 55 acre "President's Lake" behind his house in Pintlala, Alabama. A newer prototype Lake Life Pump spins 24/7. He believes this device prevented his lake from stratifying. I was skeptical. The biologist in me wasn't necessarily buying what he was telling.

That afternoon, as the sun began to set, Scott invited me into his Triton boat for a quick spin. It was balmy hot, upper 90's, cotton shirt sticking to skin. We idled near the Lake Life Pump so I could see it work, a fan blade-looking gadget turning ever so slowly, pushing water downward. I was trying to wrap my brain around the whole idea.

We backed away from the machine; Scott picked up a rod with a silver spoon on the end and flung it about twenty feet from the Lake Life Pump. As the spoon sank, he said, "The lake is about 22 feet deep right here." In a few seconds, the line went limp. Lure on the bottom. On the third crank, the line went tight. He set the hook and in less than a minute, he boated a two pound bass.

The fish hit 18 feet deep. In July.

I was flabbergasted. It surprised me more than if a snowstorm hit.

I asked if he kept records...oxygen and temperature.

He had. He shared. I looked. This lake was not stratified. The fish had all the water they wanted.

Fast forward to today. Ray Scott isn't in the manufacturing business. But, Kasco Marine is. After twenty odd years of contemplating, engineering and planning, Ray Scott's idea has moved into the manufacturing stage. About a year ago, Kasco teamed with Scott to put this device on the market so people like you and I can buy one. I've had to ask myself why this unit is any better than any of the other devices around. I'll tell you this. I think aeration and water circulation is no doubt the wave of the future. With all the great companies out there and products they offer, aeration is definitely an achievable goal. No electricity? Look at Solarbee (although they are a bit expensive, you get what you pay for)

or a windmill aerator. Electricity, yes? Evaluate, then buy. I see this Lake Life Pump as a heart that pumps water throughout the entire body of water. I see it as a device that gently and naturally massages a lake. I also see it as affordable.

While many systems out there suit smaller ponds and lakes, the Lake Life Pump will work best on mid-size lakes. Sue Cruz has convinced me that Vertex and the other companies can design a blower system for larger lakes. At the same time, I see the Lake Life Pump as a great device for lakes pushing 15 acres, maybe larger, depending how deep they are. It will also do well in lakes as small as 3 acres. A pond or lake smaller than that? Probably not the best device.

I think Kasco's and Ray Scott's Lake Life Pump will work well in preventing stratification. But, I am not yet convinced it will de-stratify a lake. It will definitely push the thermocline downward, but I can't see it eliminating stratification, once the lake gets there.

To sum it up...I am in my 29th year as a professional fisheries biologist. In my opinion, this single device can revolutionize the way we manage ponds. I believe it will open up new avenues for people who heretofore have chosen not to manage a pond, especially in the northern part of the country. And, I think as people become aware of what they can do to cleanse and freshen their water and keep it that way, more doors will be opened for all our friends in the pond management and aeration industry.

As an industry, we understand we are in the stewardship business, teaching and doing it. The Lake Life Pump is a machine that embodies stewardship.

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*Protect*

With the Lake Life pump you can prevent fish kills due to low oxygen, insure your investment in your fish, and improve overall water quality. 1 HP of energy will circulate a pond up to 15-20 acres to a depth of at least 12 feet.

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# Bad Lakes Gone Good

*By Cary Martin, Vice President, Aeration Technologies, Inc.*

**W**hat causes a formerly pristine lake, teeming with fish, to go “bad?” It seems not so long ago that these beautiful bodies of water were “good.”

Years ago, when the lake was “good,” there weren’t so many shallow areas and the water was clear enough to see your feet when swimming. As lakes age, siltation occurs and decaying plant matter builds up. The bottom of the lake becomes a mucky, smelly mess. This process takes years, spurred by natural production of plants utilizing energy from sunlight mixing with air and water through a vehicle called “photosynthesis.” Over time, this accumulation of organic matter on the lake bottom is the primary cause of a lake going “bad.”

“Bad” water leads to trouble...like fish kills.

Ironically, as organic matter builds up, the problem is compounded. More organic matter feeds more plants which creates more organic matter. It’s a vicious, normal, natural cycle.

Another watery irony revolves around mankind’s need for speed. Faster cars, faster airplanes and faster food leads to faster eutrophication (aging) of ponds and lakes. Effluent discharge from cities and towns flushes downstream, into lakes. Storm water rolls off pavement and rooftops, snatching whatever it can to deposit into our lakes and ponds. Lawn fertilizers, grass clippings, tree leaves and septic tank lateral lines percolating through soils share their goodies. These point sources increase biological productivity, especially algae and aquatic weeds. Mother Nature has many rules. One of those? When any kind of

nutrient comes into water, it won’t just sit. It will grow something, somehow, some time.

As this buildup occurs, water works to compost dead organic matter. Increased demand on dissolved oxygen content is a consequence of this process. It happens two ways. Dead organic matter decomposes, sucking oxygen from the water. Living plants produce oxygen during the day and take it up at night. Oxygen problems occur when consumption exceeds the amount of oxygen produced through photosynthesis and diffusion from the air.

To compound the issues, pond water responds in a most natural of ways as greenery grows. Water stratifies. Thermal stratification adds to an already growing problem. Dense algae blooms accumulate near the surface to absorb sunlight. But, this dense living microscopic mass hordes sunlight, effectively shading the lower depths. The result is most of the oxygen produced is now located near the surface. This process leaves a larger volume of water underneath that fertile two to four foot layer. Deeper water is deficient of oxygen. As the sun warms top layers, the shady area underneath remains cool. Since warmer water is less dense, it floats on top of cooler water. At some point, there is a well defined temperature separation called the “thermocline.” Oxygenated water from the surface can’t push through the thermocline. Water below the thermocline begins to process its organic build up without oxygen. The result is a build up of hydrogen sulfide and carbon dioxide gases along with some metals and minerals.

Okay, so what does this have to do with you?

Plenty. This is life under water in your pond, my pond...everyone’s pond. To understand how to best manage your water, you should know how things work so you can develop a thoughtful strategy to counter the processes which go against your pond goals.

Oxygen in ponds comes from two sources: photosynthesis and diffusion from air. The amount of oxygen in pond water can vary considerably from pond to pond and from hour to hour in each pond. However, oxygen concentrations are typically lowest at dawn and highest during late afternoon. The amount of oxygen a pond can hold is dependent on atmospheric pressure, salinity and temperature.

The amount of oxygen fish need compared to humans is substantially different. We breathe air with almost 21% oxygen content. Fish breathe water with an oxygen content of 0.0008 or 8 parts per million, also expressed as milligrams per liter. This is equal to one person in a Super Bowl stadium, a pinch of sugar in a 5-gallon bucket or 1 drop of food coloring in 1-gallon of water.

So, how in the world can a pond NOT keep enough oxygen to keep fish alive forever and ever?

Water has its limits. It juggles lots of processes.

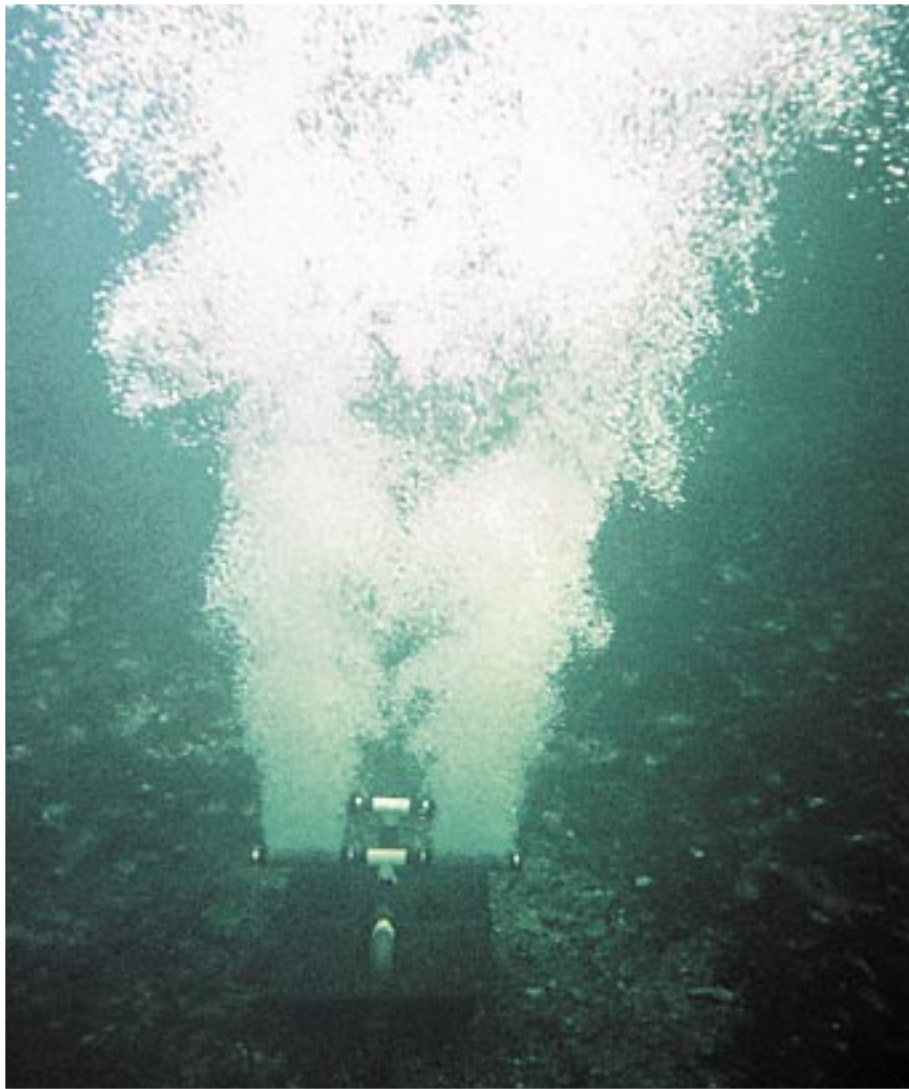
Chemical transformations and interactions are where the actual magic takes place. Start with nitrogen transformation. Of many combined forms of nitrogen under water, the most important are ammonia and nitrate. Both can be assimilated to produce amino acids to be used by the algae and weeds. After all, nitrogen

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**As lakes age, siltation occurs and decaying plant matter builds up.**

---

# Cary Martin - Aeration Technologies, Inc.



*Cascading bubbles form a mushroom effect, moving water vertically.*

is a nutrient for plants. Stir in some phosphorous and we have the makings of a natural soup that all plants love.

Decomposition of organic matter results in release and accumulation of ammonia. Under aerobic (with oxygen) conditions, ammonia is oxidized in a two step process called nitrification (Phase I to nitrite; Phase II to nitrate). Under anaerobic (without oxygen) conditions, nitrification of ammonia to nitrate

does not occur, and ammonia accumulates at the bottom of the pond. Enhancing nitrification of ammonia to nitrate and subsequent use of nitrate in denitrification can stabilize and reduce internal phosphorus loading, which feeds algae and plants.

Here's how all this science ties together.

Oxygen loss is directly related to eutrophication, or the level of aging of a pond. Add sediment phosphorous release which feeds

algae and weeds and the potential of a fish kill quickly becomes reality.

Aeration relieves those natural symptoms by increasing the rate of dissolved oxygen input (increasing the aerobic respiratory capacity). Aeration affects almost all aspects of the lake: nutrient cycling, heat distribution, bacteria, phytoplankton and fish.

Aeration allows the pond to breathe.

To speed up aerobic digestion and ensure achievement of aerobic benefits, pond owners can choose mechanical aeration. Today's market has a number of different products: Surface aerators, floating fountains, horizontal circulators, or lake bed aeration.

Surface aerators are floating units with a pump mounted beneath the float. They are efficient as an emergency aerator or to keep a constant oxygen supply on pond's surface. Some units have the ability to pull from below the thermocline by using a draft tube. Typical surface aerator sizing is 2 hp/acre.

Lake bed aeration is a method of compressing atmospheric air and pumping it to the lake bottom, allowing it to flow through a series of diffusers, creating micron-sized bubbles to act as an airlift. The misconception is that oxygen is transferred to water through the bubble surface. Actually, less than 5% of oxygen is transferred that way. As bubbles rise they expand. Cascading bubbles entrain cold dense water below the thermocline and lift it to the surface, allowing gasses like hydrogen sulfide and carbon dioxide to escape into the atmosphere, where they belong. At the same time, oxygen is absorbed and eventually circulated throughout the water column. The bottom of the pond becomes aerobic and metals such as iron are precipitated while phosphates are again rendered unavailable. Unlike surface units, lake bed aeration uses an unconfined airlift technique; the amount of energy required is reduced to circulate the entire volume of the lake or pond. In this case we choose system size by turnover or circulation rate of a minimum of 0.75 times per day. That means we engineer the system to turnover the entire volume 0.75 times per day. In larger lakes, 20-acres plus, that rate is reduced depending on the surface acres, depth and shape. This is because

# Special Section - Aeration



*This system is esthetically appealing as well as functional.*

larger lakes have greater surface area for still-water surface aeration.

Your pond and its fish depend on oxygen for life. Just like you and I, if oxygen supply is cut off for even 15 minutes, fish die. It does not matter how high the level was earlier in the day, you must be concerned with extremes as well as the chronic low levels that may not necessarily kill the fish, but definitely stresses them. As low oxygen conditions continue, buildup of harmful gasses continues, thermal stratification will grow and the potential of a deadly mixing that results in a fish kill increases.

In a fertile green water pond, algae will typically draw more oxygen at night than will the fish. A heavy accumulation of sediment can also draw more oxygen than fish.

#### **Here are some actual numbers:**

- Ten pounds of fish will consume about 0.003 pounds of oxygen per hour.

- Five thousand gallons of “green water” (phytoplankton equivalent of 100 mg/l of chlorophyll “A” and 2,000 zoo plankton per liter) with the equivalent of 20 mg/l Biological Oxygen Demand will consume about 0.8 pounds of oxygen per hour.

- Sediment oxygen demand for a mucky pond is 0.006 pounds per square yard.

- Doing no mechanical aeration and relying on the wind, still water rate from the atmosphere at night is about 0.00002 pounds per square yard per hour.

In summary, if left alone your pond’s goal is to become a grassy meadow. Who wants

to mow more grass in summer? You have the ability to slow down that process and in some cases even reverse it. The simple aeration system, be it a surface unit or lake bed system, is the life support for your pond.

If your pond has gone “bad,” aeration may be the best ticket to turn it back into the one you remember as “good.”

*As well as V.P of Aeration Technologies, Cary Martin is president of the North Carolina Lake Management Society. From his home base in Burnsville, N.C., Martin covers much of the United States, assisting in the custom design of aeration systems for ponds and lakes.*



# Cary Martin - Aeration Technologies, Inc.

Cary Martin founded Aeration Technologies, in Burnsville, North Carolina because he saw a need. He came to a profound conclusion after employment stints with SeaWorld of Florida, as a technician with Aquatic EcoSystems in Apopka, Florida and some time with a lake management company treating aquatic weeds. Add a tour with the United States Coast Guard as a Marine Technician, mix all that experience and what Martin learned influenced him to get into the pond aeration business. "I learned about water quality with the Coast Guard, aeration equipment with Aquatic EcoSystems and aeration with SeaWorld. But, when I worked treating aquatic weeds, it hit me. All we were doing was putting a short-term band-aid on a larger problem. Aeration stabilizes a pond and I knew that would be my course." So, Martin relocated to North Carolina and went to work. Aeration Technologies, Inc, custom designs pond aeration systems. Martin says, "I am a paramedic for ponds." His company collects information about each pond including the depth, width and length to calculate volume and then, based on pondowner goals, designs the best bottom diffuser aeration system to meet those goals. Martin still maintains his membership as a Marine Safety Officer in the U.S. Coast Guard Auxiliary. His 17+ years experience specifically in the pond aeration business makes him more than qualified to do what he does as an aeration expert.



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It takes more than just making bubbles to aerate a pond properly. We SOLVE pond problems every day... it's the impossible ones that just take a little longer to solve.

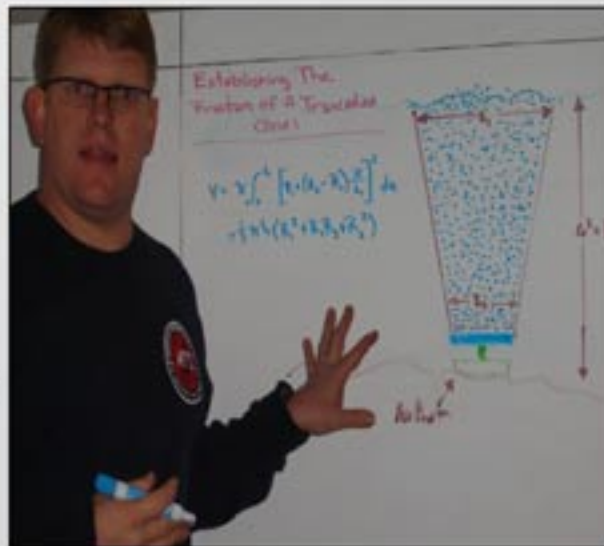
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EMAIL: [info@aerationtechnologies.net](mailto:info@aerationtechnologies.net) Ph: 1-800-609-6385

599 E. Main Street, Burnsville, NC 28714,



Cary Martin Establishing The Frustum Of A Truncated Cone At An Aeration Workshop

## Bottom-Placed Aeration

*By Sue Cruz, Aeration Sales Manager,  
Vertex Water Features*

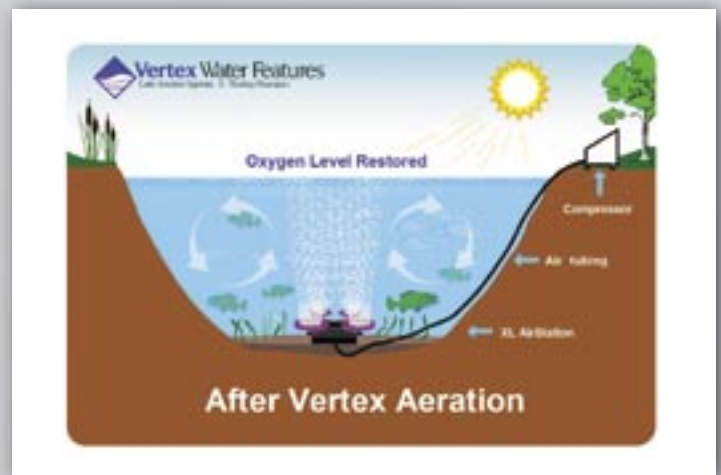
“My pond is smelly, covered with algae, and my fish are gasping for air!” These are sometimes the first words I hear from a pond owner when the phone rings to discuss aeration for a water body. More often than not, these “cries for help” occur during the hottest, driest months of the year when water is stagnant and shallow, when algal species and other aquatic plants thrive and when dissolved oxygen levels “bottom-out” just before sunrise. I try to talk the pond owner through the situation and offer constructive, short-term suggestions to solve the immediate crisis but, once a pond has reached this point, the event usually continues and fish are lost. I’m left wondering why preventative measures weren’t taken, and why an appropriate aeration

system wasn’t installed earlier. Especially, since the effects and benefits of artificial circulation, for this example and other situations, are dramatic and well documented.

In temperate climate zones most ponds naturally “turnover” twice yearly. Generally, this occurs once each fall and again in spring. During turnover, low oxygen bottom waters mix with the pond’s well-oxygenated surface waters. This circulating action breathes new life into bottom areas of the pond, raising oxygen levels, lowering nutrient levels and providing fish and other aquatic life a winter refuge. Unfortunately, due to urbanization, agricultural development and other demands of the pond’s watershed and the resulting increase in dissolved nutrients and oxygen demand,

two turnovers per year simply don’t provide a pond’s aquatic environment with sufficient dissolved oxygen to support life year round. At some point, something must give. Fish kills, muck accumulation, odor, algae growth and declining fisheries occur.

Proper aeration design for a pond or lake effectively mimics Nature’s twice yearly turnovers but increases the turnover rate to about once per day. Faster turnover rates prevent nature’s need for a semi-annual event by keeping the water from stratifying in the first place. Water is destratified and aeration provides constant dissolved oxygen levels from top to bottom throughout the entire year. This “artificial circulation” increases habitat for fish and other aquatic wildlife by expanding the



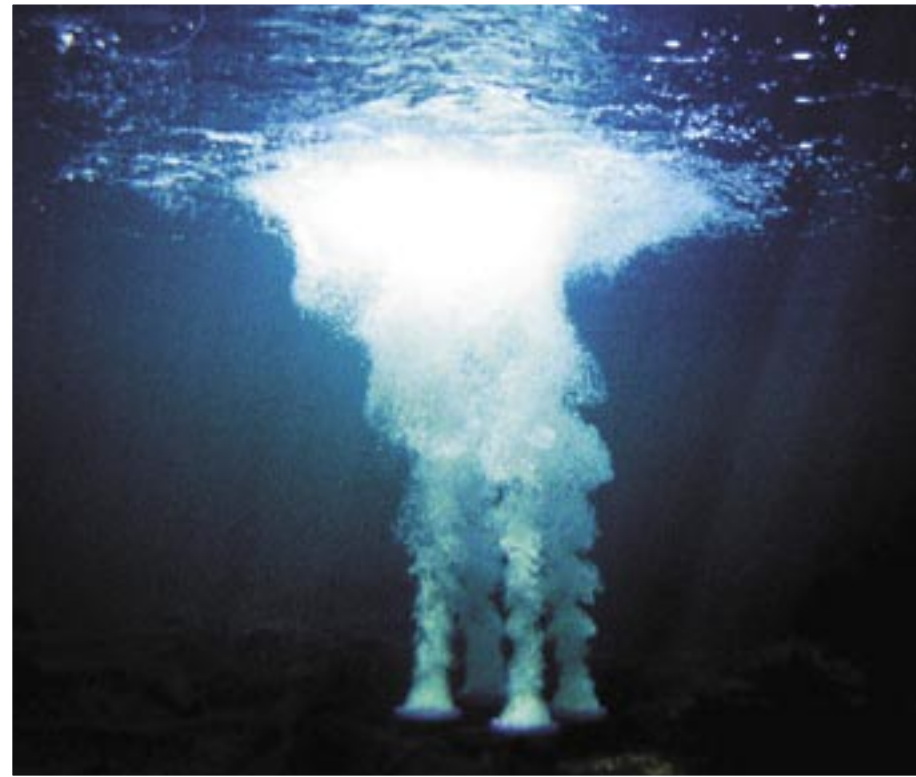
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**During turnover, low oxygen bottom waters mix with the pond’s well-oxygenated surface waters.**

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# Sue Cruz - Vertex Water Features



*Above: Bubbles from the Vertex System move water upward, effectively mixing the entire water column.*

healthy areas in which they can live.

Aeration also allows fast, “muck-munching” aerobic bacteria to replace noxious, gas-producing, anaerobic bacteria, while, at the same time, circulating water to allow gasses which create odor and taste problems to be rapidly released into the atmosphere. Aeration helps control and manage nutrient levels, offsets biological oxygen demand (BOD), and prevents water from freezing during cold weather. When icing is minimized, resting areas are left open for ducks and other waterfowl, docks and boats are protected, and winter fish kills are often prevented.

One way to achieve the benefits of aeration is through a bottom-placed diffuser system. Shore-mounted compressors feed air through self-weighted airlines to either single or

multiple air stations. Millions of tiny bubbles naturally rise, creating vertical columns of air that effectively pump thousands of gallons of water per minute from deeper areas of the pond to the surface. As un-aerated water from the bottom reaches the surface, it layers out, like a giant wet mushroom, absorbs oxygen, and releases harmful carbon dioxide and hydrogen sulfide gasses before eventually returning to the deeper regions to begin the circulation cycle again.

Bottom-diffused aeration moves a tremendous amount of water while using a relatively small amount of energy. Because air is so much lighter than water, pumping air instead of water to create additional circulation substantially reduces energy requirements. One common misconception about bottom aeration is the belief that aerating effect results from the air bubbles diffusing oxygen into the water column. In reality, very little oxygenation occurs directly between the air bubbles and pond water. The vast majority of oxygen



*Here's an entire system, engineered and ready to install.*

# Special Section - Aeration

transfer occurs at the pond's surface when the bottom water spreads out as a result of the bubble column's pumping action.

To provide maximum pumping efficiency, diffuser design must change with increasing depth. Bottom aeration can be effective in as little as 4-5 feet of water but the diffuser design for very shallow water is far different than a diffuser designed for 8, 12, 20 or 50 feet of water. "One Size Fits All" may apply to socks but certainly not to bottom air diffusers. The more efficient a bottom diffuser is, the less electricity is needed, less compressor capacity is needed and fewer diffusers and air tubing are needed. Correctly designed and sized aeration systems can provide significant short and long-term savings to the owner.

Design characteristics of bottom aeration products allow for easy scaling of equipment to properly aerate large lakes and reservoirs as well as the homeowner's backyard "ole' swimmin' hole". Some deep water diffusers



*The system is running, doing its job to turn the water over and over and mix it, so the water can do its job of processing what Nature brings it.*

## For Healthy Lakes & Ponds Find Out Why More Professionals Rely On Vertex



### **VERTEX LAKE AERATION CONTROLS:**

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*"Vertex offers the perfect aeration system. I've dealt with water problems for a long, long time. Trust me, the Vertex Aeration Systems really worked by breathing new life into my lake and pond."* Bill Dance

**WARRANTY**  
Compressor: 2 yrs  
Diffuser: 5 yrs

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Lake Aeration Systems & Floating Fountains

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[www.vertexwaterfeatures.com](http://www.vertexwaterfeatures.com)



# Sue Cruz - Vertex Water Features

have grid patterns exceeding 4 feet across creating massive upward flowing columns of water. A typical four diffuser aeration system designed for normal depth ponds and powered by two 1/3 Hp compressors can effectively aerate up to a 10-acre area and have a cost of around \$5,000.00 (depending on the amount of weighted tubing needed).

Ideal for recreational waterways, these systems do not introduce electricity into the water and have no surface obstructions. Pumping air safely from a convenient shore mounted compressor to underwater diffusers avoids the electrical risks, dangers and liability associated with connecting electrical motors, pumps, blades, cables, splice kits, control panels, etc. to surface mounted aeration devices far out into the water. Another advantage to bottom aeration is exactly that, the aeration equipment is safely placed on the pond bottom out of sight and away from boaters, swimmers, children and vandals.

It should be remembered all ponds are different. Owners' goals often vary. Different species of fish have different needs, and pond size, shape, depth and other circumstances influence what type and size aeration system is needed. At our company, systems have been independently tested, so we know how much water is lifted at different depths and airflow volumes. This information allows us to properly size an aeration system for any shape or size of lake or pond.

There are very few manmade and natural water bodies that wouldn't benefit from being aerated. Notable exception are ponds intended for cold-water fisheries such as trout or cool



*The air compressor box can be thoughtfully placed, out of the way and unobtrusive.*

water species such as Northern pike. Diffused aeration may cause bottom temperatures to warm too much in summer months leaving cold-water fishes without a safe refuge. By placing diffusers in shallower positions, deeper portions of the ponds remain cold throughout the summer yet still allow for the benefits of aeration and protection from winter fish kill.

During the annual cycle of most ponds, there will be stratification, low oxygen events, periods of increased BOD, or icing problems that could be prevented or alleviated if properly aerated. Vertex offers a simple, safe, and affordable product to provide solutions to these and other

problems when properly designed and used. Before long, as the temperature warms up, calls from desperate pondmeisters will be coming in; one after another. Please be proactive and take the steps to protect your aquatic assets before it's too late!

*Sue Cruz has a bachelor's degree from the Fisheries and Wildlife Sciences Department at North Carolina State University. She has worked as a field biologist for a Florida lake management company before going to work for Vertex.*



*When someone calls Vertex Water Features requesting a recommendation for pond aeration, a staff biologist will gather as much information about the pond as possible. Some important issues to take into consideration include: geographical location, size, depth, shape of the pond, power availability, species of fish, watershed, pond uses and pond owner's goals. Vertex uses the latest aerial imagery technology, proprietary sizing software based on our independent testing data, combined with first hand experience to create a data-based approach to design/sizing aeration equipment.*

*Sue Cruz, Aeration Sales Manager, Vertex Water Features, 1-800-432-4302*

# Move Water to Keep it Healthy

By Dr. Bruce Richards, Solarbee

Most of us who live around water imagine we'd like to walk to the shoreline, look over the edge and peer through clear waters to see the pristine lake bottom. That's a nice daydream, but unfortunately it really doesn't hold much water, so to speak. Nearly all the impounded freshwater we see nowadays is in some sort of trouble; sometimes loaded with algae, and often low on oxygen at daylight. The story usually goes like this: during the day, surface algae grows, adds oxygen to the water, but over a fairly short period of time, grows out of control turning the water cloudy green. During the night, the algae no longer photosynthesize, so it takes in more oxygen and gives off more carbon dioxide.

For creatures which live in water, this escalating event, caused by algae, can become a serious problem.

Avid pond lovers consider ways to improve and manage oxygen levels in their local lake or home pond. Lake experts know how hard some pondmeisters work to battle runaway aquatic plants and algae. Rake it out, pull it out, algaecides, chemicals...it's a battle every summer.

There certainly are a lot of products on the market to "fix" your pond or lake. Many of these products require qualified technicians to apply or install, and good aeration units are not cheap. Since chemical costs are increasing and many states are limiting herbicide usage, more people are considering aeration or circulation as a means to stabilize their waters.



*A deployed unit, doing what it does, lifting water from the depths and moving it upward and outward.*

### Algae Provides Oxygen

Why should you consider aeration or circulation in a body of water? From time to time, most of today's freshwater systems are plagued with excess cyanobacteria fed from surface phosphorus runoff due to human activities. If your pond has people nearby, there will be plenty of nutrients to feed algae in surface water. Ironically, the little algae critters are where we first got our oxygen to breathe.

About 3-1/2 billion years or so ago, give or take a mere few million years, there was an organism which grew out of a heap of amino acids, took up and converted sunlight into energy, cell structures and then gave off oxygen. Enter the birth of cyanobacteria, or blue green

algae. We can thank the good Lord for this tiny little plant and its role of bringing oxygen into the atmosphere, mixing this life-giving element with nitrogen, carbon dioxide and a few other gases to give us...drum roll please, "air."

Cyanobacteria ushered oxygen into the atmosphere of this planet. Soon after blue-greens other photosynthetic species followed, taking in carbon dioxide and giving off oxygen. The Earth became "aerobic," like it is today. Air is a neat thing. Only about 20% of the air we breathe is oxygen. 2/3rds of the oxygen in air we breathe is emanating from the ocean algae, much of which is oxygen produced by cyanobacteria. The blue-greens are hardy critters and have learned how to survive. There are essentially no

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**Cyanobacteria ushered oxygen into the atmosphere of this planet.**

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# Dr. Bruce Richards - Solarbee



*A Solarbee unit can circulate water over a fairly large area.*

predators to blue-greens, and most species “fix” nitrogen from the atmosphere, that is, they take

robs water of much needed dissolved oxygen for fish. Keeping consistent levels of oxygen



*One of the services Solarbee, Inc. provides is on site training. Here, two employees pay attention as the technician teaches them exactly how the unit works and what needs to be done for maintenance.*

nitrogen gas directly for nourishment. So, they can feed themselves.

Today, in order to have a good lake or pond ecosystem, there’s a need to eliminate or at least curtail growth of cyanobacteria. As cyanobacteria respire, which means it is taking in oxygen and giving off carbon dioxide, it

in a lake or pond is a major challenge to lake managers.

If you and I have oxygen, a suitable temperature range and enough food, we pretty much have what most living creatures need to survive. Take your favorite pond or lake for example; you’ll quickly notice oxygen is just as

important to the fish, zooplankton and beneficial plants as it is to us land creatures.

In earlier college days I used to wonder why fish couldn’t just take the oxygen molecule from those that make up water. After all, isn’t water (H<sub>2</sub>O) made up of hydrogen and oxygen? The reason is that the oxygen part of water is reduced to a chemical state that makes it unavailable for fish to use. That oxygen is bound with two hydrogens...and those hydrogen atoms fight to hang onto their oxygen. It’s the free oxygen (O<sub>2</sub>) dissolved into water that’s important to fish for breathing.

Okay, so now you’re convinced that sufficient levels of oxygen are important to a healthy freshwater ecosystem. How is a lake aerated? First of all, oxygen is partially diffused into the water at the surface. Secondly, photosynthesis provides ample DO, especially during daylight hours when algae and green plants are in peak growing phases. Oxygen from the surface atmosphere can mix with water through wave action caused by the winds. These processes are all well and good, but sometimes the wind doesn’t blow and algae aren’t always our friends. You may need to consider aeration or circulation.

## Basic Types of Aerators

Air injection is a method for essentially pushing air down into the water using an electrically powered compressor. Tubing under the water has small holes that allow air to escape and flow upward. A lot of these units work better if they’re off the bottom and not potentially clogged with organic muck that can form at the bottom. I’ve seen where some lakes increase their DO concentration using air injection. Be careful with the type of compressor you choose, they can be pretty noisy; and some use a lot of electricity.

Another aeration technique is using floating platforms with an impeller that pushes water downward to force some air into the lower reaches of the pond. There are some claims that these systems “destratify” a lake. This means that the natural warm upper water mixes with the cold lower water to achieve a uniform temperature. My experience is this isn’t likely.

# Special Section - Aeration

It simply takes too much energy to unify the temperature in a lake. By reading all the back issues of Pond Boss, by now you know that the warm water (epilimnion) sits on top of cooler water (hypolimnion). Water density increases

at lower temperatures forming a separating zone called a thermocline, which is an area between the warmer and cooler water. In shallow lakes, the water doesn't usually form a true thermocline, but there can still be small

variations in temperature from the surface to the bottom. If you think about it shallow water sure gets a lot of warmth from the sun.

Fountains and sprayers are very popular. People love to see water jetting out over a pond. Fountains pick up water, hurl it into the air in a pretty pattern and then the flying water splashes some air into the pond's surface. You'll usually see a nice open area around the fountain. Another neat thing about fountains is they help keep sounds like road traffic down to a minimum with the soothing sounds of splashing water. These systems can provide some aeration, but do not have much beneficial control of algae growth. Algae species grow pretty well outside the water ring of the fountain.

There's the waterfall method too. Water is pumped over a series of baffles above the surface and allowed to fall into the pond to push aerated water downward. Some folks like the idea of a waterfall instead of a fountain since this method is a little more "natural" looking. Waterfalls are very popular with the small backyard water gardens.

Some aeration systems don't need electricity. There are wind-powered units that use the



*Solarbee, Inc. provides installation of their units. This one is being assembled on site, almost ready to put in the water.*

*Solarbee, Inc. is a world innovator for water management. The company, based in Dickinson, North Dakota, has focused on "green" power to allow Nature to vertically move impounded water.*

*SolarBees are up-flow pumps with a flexible intake hose that can draw water up from any depth. The bottom plate beneath the 40" diameter intake hose enables water to come into the SolarBee horizontally from long distances. This prevents re-suspension of bottom sediments, even when the SolarBee intake hose is less than a foot off the bottom. The specially designed distribution dish at the surface allows flows up to 10,000 gallons per minute (up to 14 million gallons per day). The SolarBee moves water radially in all directions up to about 700' to 800' away from the machine. In this way, upper waters are put into a slow but continuous motion. Keeping this consistent flow over the surface interferes with vertical algae migration.*

*The SolarBee was designed for low maintenance and a long 25-year life. Three 80-watt solar panels provide enough energy to run the sealed, magnetic motor and digital control box both day and night. The efficiency of the SolarBee design is that one unit can treat up to 35 acres of lake surface area.*

*The SolarBee is now a well-proven tool to improve the oxygen levels in a lake or pond and help balance the freshwater ecosystem in the course of months rather than decades. Circulation helps distribute oxygen; the SolarBee does a good job to help nature keep things moving, making that water clearer and ultimately more productive for the fish we love to catch.*

*Be aware, though. Solarbee Units are not cheap. But, how much is your pond worth?*

# Dr. Bruce Richards - Solarbee

breeze to raise and lower a shaft which forces air down into the water like a piston. Out west, windmill mixers help keep ice from forming on pastureland ponds where cattle are grazing and need drinking water in frigid winter conditions.

## Is Circulation a Type of Aeration?

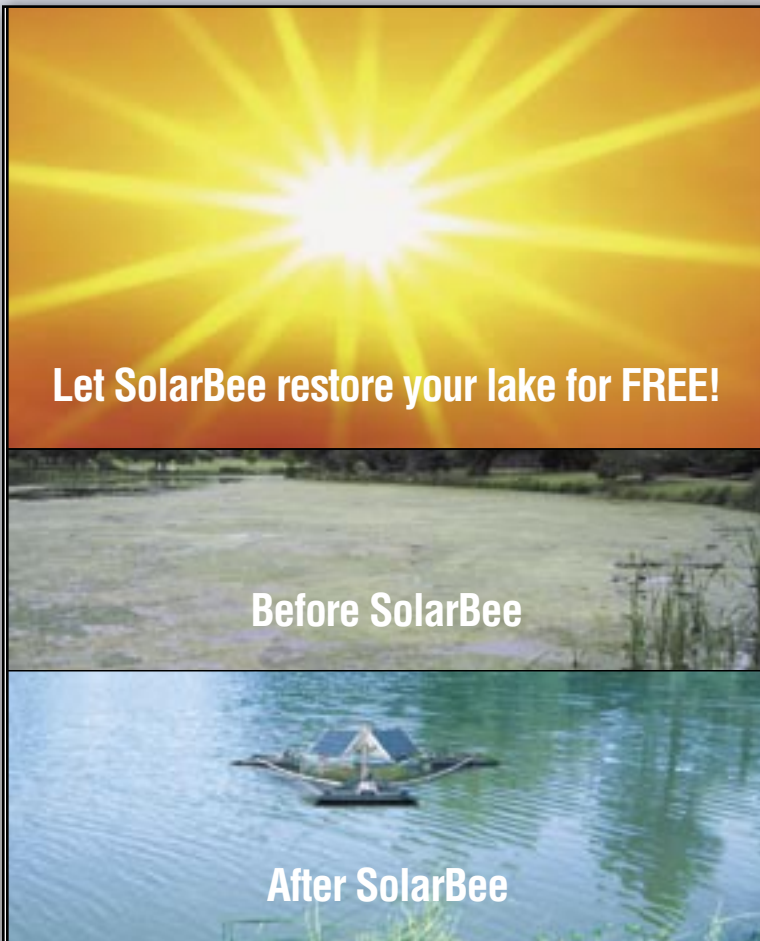
It's been pretty well accepted by most scientists that you either starve the blue-greens or you stop them from reproducing. Starving blue-greens means limiting the nutrients by long-term watershed management. Reducing these nutrients is an important and necessary lake management strategy...but it's going to take years, if not decades, to make an impact. Keeping cyanobacteria populations from blooming means disturbing their

habitat. Cyanobacteria love warm, still water. Circulating water over a large area disrupts their habitat. Moving water reduces the potential for blue-greens to bloom. Preventing blue-green algae blooms allows nutrients to go into edible, more beneficial algae. Because these beneficial algae do get eaten and move up the food chain, water clarity improves as the fishery becomes more vigorous.

About ten years ago, solar powered circulators came on the scene. Using power from the sun, these machines were designed to push surface water out creating upward flow from the bottom. By creating an almost frictionless flow, called near-laminar, these machines disrupted surface algal blooms. In recreational lakes most of these units circulate the upper water where the most photosynthesis

of blue green algae occurs. This circulation system grabs or "entrains" the air and helps oxidize near-shore sediments, where fish spawn. In drinking water reservoirs, the intake can be lowered to lift water from the bottom. The new solar units run off battery power into the evening hours after dark, extending mixing time and improving the lake or pond in a relatively short period of time.

Pond and lake managers have good options to consider when looking for ways to improve aeration and circulation. There are plenty of companies in the country which sell good equipment. Most folks realize that moving the water helps care of the lake, kind of like exercise helps people. Moving your water cleanses it.



Let SolarBee restore your lake for FREE!

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**Do it with SolarBee**, a floating solar-powered circulator that is economical for virtually any size lake or reservoir, requires no infrastructure changes and is designed for day-and-night operation using only solar energy. SolarBee's laminar flow circulates up to 10,000 gpm. As a result, it eliminates cyanobacteria (blue-green algae) blooms, enhances water clarity and secondary production (both zooplankton and fish), oxygenates lake bottom waters and sediments, prevents seasonal fish kills and reduces nuisance aquatic weed growth – **all without yearly doses of toxic chemicals or fossil fuel consumption.** Even better, SolarBee works for up to 25 years with little or no maintenance. And best of all, because it's solar-powered, SolarBee runs for FREE! Call 1-800-437-8076 and ask for a free copy of "Common Sense Advice on Lake Restoration" to discover how nutrient reduction is not the way to improve water quality. Or log on to [www.solarbee.com](http://www.solarbee.com)



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# Setting the Stage to Buy an Aeration System

by Clarke Dewitt, John Baylor, Bob Heideman, Matt Rayl

Just like people, no two ponds are alike. Since our company offers all types of aerators our biologists can help determine which type is best for each customer. Of the many pond management options available, aeration stands as one of the most reliable.

But, it is not as simple as that.

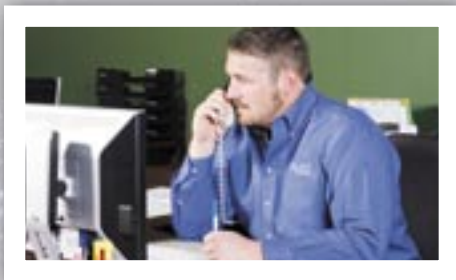
When a call comes in to our Lakes Department inquiring about aeration, a trained biologist takes the call, not a sales person. The first order of business is to determine if an aerator is the right management tool. As you can imagine, we have a whole series of questions to be answered before we can diagnose problems and offer solutions. The very first question is always, "Why do you think you need aeration?" Too often they were told by someone or some website that aeration could solve a problem that it really cannot.

The next question is, "What is the purpose of the pond?" For some it is a trophy bass pond, a fishing pond for the grandchildren, a swimming pond to escape summer heat, a duck pond, a wildlife attractor or it is just to beautify the landscape. Each purpose can bring different recommendations.

We then have a series of questions that provide the biologist with the pond's geographic location, its size, shape, depths, weeds, color, seasonal water clarity, algae, bottom composition, age, history, fish species and density, fish feeding habits, water source, water outlet, etc. All this information is needed in order for us to get the diagnosis correct and make the correct recommendations. It can get quite complicated. As any professional, our duty is to recommend the right solution. Once we figure out that an aeration system is the

solution, sizing is extremely important. No one should have to pay higher utility bills due to oversized or inefficient equipment. And, you can't get it right without having all the right information and a lot of experience.

Once convinced the pond would benefit from aeration, we discuss what type the customer would like, and need, be it a fountain, an electric splash-type aerator, or a bottom-based air-powered aerator. Pond size, shape and depth affect sizing this equipment. For instance, a fountain in a deep pond could be made much more effective if it took its water from the bottom. A shallow pond, on the other hand, can use a simple floating fountain. If it is a deep, heavily stocked pond, we may recommend both an air-powered destratification system along with one or more floating aerators, with the floating units operated with timers and the



*Left: Biologist Matt Rayl consults with a client to help design the best system possible. Asking all the right questions and matching the answers specifically to the pond is a key step in the decision making process. Middle: Next, we prepare the custom designed system for shipping. Right: System in place, running, bubbling and doing what an aerator does, moving the water.*

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**The first order of business is to determine if an aerator is the right management tool.**

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# Aquatic Eco-Systems, Inc.

destratification system operated continuously. If the pond is prone to ice over in winter we give specific guidelines as to when to turn systems on and off.

Bottom-based, air-powered aerators are the most cost-efficient for ponds and large lakes whose depth is greater than eight feet. However, caution should always be used because this technique de-stratifies the water quickly, possibly causing problems upon startup in stratified water bodies. It can also aggravate a fish kill by raising bottom water with low levels of dissolved oxygen. But once a pond owner

knows how and what to do, they will most often select bottom-based, air-powered systems because of their efficiency and economy. As a result, we sell more of these than any other type. There are two, often overlooked benefits to this technique: There is no electricity in the water so there is no risk of electric shock, and you do not have to have electric power at the pond. You simply locate the air compressor where the power is and run an inexpensive air line to the pond, even if it is 1,000 feet away.

Undersized or underperforming aerators can have devastating consequences. Nutrient-

rich, low-oxygen water can be raised to the surface, providing high levels of phosphates for increased algae growth, and/or the oxygen demand of the pond can exceed the oxygen transfer capabilities of the aerator, resulting in a fish kill.

Aeration is a time-proven, cost-effective, healthy way to aid in successful water quality management, but be cautious of undersizing that can adversely affect the pond and oversizing that can adversely affect your utility bills for years to come.



*Aquatic Ecosystems is truly a pioneer in the aquatic tool business. Their giant catalog is packed with all kinds of "boy-toys" from testing equipment to fish nets to hatchery supplies to custom designed aeration systems. For more than 25 years Aquatic Ecosystems has been the "go to" company for every tool, system, hose, pump...or any "stuff" that a pond owner, pond pro, fish farmer or a housewife might want to buy. Not only do they have all the things a pond, or its owner, might want, they have a highly qualified staff to guide you to the best product for the right application. This company is truly an international business with a down-home flair for helping people.*

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# The “Good Ole” Farm Pond

by John Redd, Outdoor Water Solutions

Traditionally, most rural landowners have used their ponds for watering cattle and horses or for the view. Others stocked their ponds with fish for their kids or grandkids to fish or for use as a swimming hole. The quality of the water and the visual appearance, however, has never been a top priority and yet these esthetic qualities are abundant in the rural market. These ponds are generally muddy, with the bottom having a foot or more of black muck and the top of the pond covered with excess algae or other aquatic plants. More and more rural landowners are beginning to think about their ponds and lakes and seeking solutions to improve their ponds.

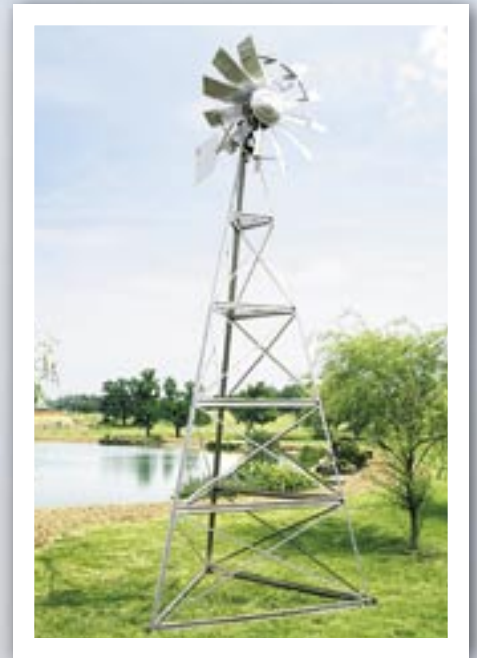
I, myself grew up on a farm in northeast Missouri. Our family farm had three ponds and each one served a different purpose. Two were to water the cattle and served as a breeding ground for bullfrogs, cattails around the edges, green scummy water and lots of black muck, the cows stood in the ponds and utilized them as needed for drinking and bodily functions. We would not think of swimming in those two ponds, let alone drinking out of them. Yet, our cows drank from them year-round.

Our other pond was for fishing and swimming, with a “no cow” swimming policy. Over time, however, the pond started to develop a 4-6” layer of black muck on the bottom and it became tougher to catch fish. All we would catch was “moss,” when we wanted to catch fish. We swam

in that same pond water as that was our only option for cooling off in the heat of the summer. We didn’t know any better, we just thought that was the way ponds were.

As time passed, we learned that putting a fence around the cattle ponds, even if it was just an electric fence, was a much better way to water our livestock, rather than giving them free reign to enter the water at any time and then moving the water from the pond to a drinking tank. We also began to experiment with aeration as a natural option to speed up Nature’s cleansing ways and chose a windmill aeration system. The most attractive feature for us was that the windmill aerated without requiring electricity, which was not available near any of the ponds. The combination of fencing the ponds from the cattle, adding the windmill and moving the water to a holding tank improved our water quality dramatically and I want to believe improved our cattle’s lives.

As I grew up and began to learn a bit more about the process of aeration and how it really works I was amazed to find that a natural solution was so effective in improving our family ponds and was amazed to find that the process of aerating an outdoor pond is very similar to that of a fish aquarium. Where oxygen is added and the water circulates, keeping it clear, clean and healthy for the fish in an aquarium, the same principle is used in wind driven aeration as it adds oxygen to the water from the bottom, improving the whole pond.



*This 20’ galvanized windmill aerator is manufactured by Outdoor Water Solutions. It’s a good choice where electricity isn’t available.*

All this is done without the need for electricity.

One of the many challenges facing this industry and the rural landowner market is knowledge of the solutions to improving water and the benefits of aeration. Aeration is a natural, effective method for cleaning our outdoor water, one of the most important resources for us to work to improve.

*John Redd grew up in rural Missouri and is still active in his family farm. John has an extensive background in the agriculture market and is active in the pursuit of solutions for improving outdoor water. If you are interested in contacting John for more information, you can reach him at 1.314.308.5889 or via e-mail at [jredd@outdoorwatersolutions.com](mailto:jredd@outdoorwatersolutions.com).*



**The most attractive feature for us was that the windmill aerated without requiring electricity, which was not available near any of the ponds.**



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# Martin's Lake

by Mike Otto

The oldest existing dam in Harrison, County, Texas is getting a makeover. One of the greatest aspects of my job not only encompasses everything dirt and bulldozer, but the people I meet.

Listen to this story.

Litt Martin is a silver-haired, semi-retired gentleman whose family owns 127 acres outside Marshall, Texas. The land has been in the family almost 100 years.

When someone says, "been in the family," there's always a good line of stories.

Litt's grandfather owned the property in 1915 and passed it on when he passed on. As you can imagine, two or three generations down the line an inheritance as this becomes somewhat diluted. But, Litt hung in there and bought the property from a variety of kinfolk. He actually has worked it out over time and now owns this gorgeous piece of land outright. Litt, with tongue somewhat planted in cheek, tells me that the family, "still fishes the lake, same as before," but now he pays the taxes, fights the beavers and does all the upkeep.

Litt is the kind of guy that always has a smile on his face and is quick to tell a good story. He's the kind of guy we all love to sit around a campfire and hear.

Early in his professional career, he sold real estate. Then, he saw value in crunched up cars...yes, the wrecking business. The first time he looked at some land with a bunch of wrecked cars on it his thought was, "this property has no value, there is too much junk." Now, he says that land was a "bed of roses." He shifted from selling houses and land to buying and selling wrecked cars.

As is always the case with successful, passionate people, Litt made the wrecking business sound like a fun trip to Las Vegas.

Mr. W. L. Martin, Litt's grandfather, bought this particular tract of land in 1914 and decided to build a lake. Back then, land was mostly purchased to homestead and produce income. Granddad didn't buy the land to farm, run cattle

or sell water to the railroad, but to create a place for family fun.

Family fun? In 1915?

In 1915 W.L. Martin was a man ahead of his time. He wanted to have a place for the family to fish. Construction on the dam began on September 15, 1915 and finished November 12, 1915. The dam was built with mules and slips. A slip, also called a "Fresno" was a bucket-looking metal device, usually pulled behind a mule. The slip scooped dirt, like a large shovel, then the mule would drag it. Behind the slip, driving the mule, was a man who decided when and where to drop the dirt. At the Martin place, there were about 50 men that drove the mules for this project. They lived on site, in tents, the entire time it took to complete the job.

Before the bulldozer and other modern equipment, moving dirt with mules, men and fresnos was the way it was done. Long hours, back breaking labor behind a beast of burden that had only one purpose, pull something (sounds familiar).

Today, we marvel at yesteryear's accomplishments. Boy, technology has come a long way. This dam was built complete with a good spillway and a siphon pipe. Yes, in 1915 Grandpa had a siphon pipe installed. I was not aware that people, back then, had any inkling about a siphon pipe.

---

**Today, we marvel  
at yesteryear's  
accomplishments.**

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As you can probably imagine, a lake almost a century old has plenty of silt. It should also have a swayback, worn out, highly eroded dam. No worn out dam here...that tells me the structure was properly maintained for years. The backside of the dam, as one would expect, is covered with giant trees. Who knew, back



*This is a "slip," also called a "Fresno." Pulled by a mule and managed by a human, it was a slow, but effective way to move dirt, way back when.*

---

then, trees on a dam weren't good?

Litt's plan is to make his lake as good for the next hundred years as it has been for the first hundred, leaving it to the family to enjoy as he has...and does.

In 1998, the wrecking yard sold and Litt decided to spend more time at the old family lake. The lake was heavily used from 1915 until about 1960 when another piece of property was developed by his father, Laurie Martin, and his uncle, Jack Martin. The lake was essentially abandoned from the mid sixties. Then, in 1997, Litt worked it out to buy the place from his relatives. He convinced his family to sell by telling them that he would build a new cabin and they could use it anytime they wanted. With that carrot, everyone signed off. Litt built a brand new log cabin in 1998, (that is a whole other story), on the site where the old cabin sat, worked his way around the new oil and gas exploration on his property and got down to some serious fishin'.

My mission that warm fall day was to help Litt make a plan to renovate the lake and bring it back to its glory of old. We talked about how to resurface the dam, the best ways to excavate the shallow areas. We talked about fish structure and rearranging some of the dirt inside the lake basin.

After visiting about the lake and renovations he wanted to make, we took a seat in his log cabin and had a glass of tea. Litt went over to a bookshelf and brought out the "Martin's Lake Register." It is an old manuscript that looked like it may have been used in the Middle Ages. It is actually a log book that started with the purchase of the land followed by the construction of the lake, and then who visited the lake, what they did, what they ate and all the enjoyment that they had. The entries are not two or three weekends a month, but two to five times a week. Martin's Lake Register records the visits to the lake from 1915 to 1918. It is specific about who came and what they did, this place is almost sacred.

Visitors usually walked for an hour from town (Marshall), carrying food and supplies to prepare meals. They fished, swam, rowed, hiked and hunted all around and in the lake. They slept in the cabin, played poker, checkers and talked and then walked back to town the next morning to go to work or school.

Three young bachelors, full of life and humor, made a pact to never get married. They helped the Martin's build a spillway, spring board and bath house. They planted holly, bamboo and dogwood trees at the west end of the lake. There were lots of projects, plantings to attract waterfowl, snake hunts, fishing, boating and lots of fun.



*The upper end of Martin's Lake is heavily silted, after 93 years.*



*Litt Martin shows an old blacksmith tool that made its way to Martin Lake many moons ago.*

Here a just a few of the many fascinating entries from the register:

"The dam for this lake was begun by Mr. Jack Callaway about Sept. 15, 1915, and completed Nov. 12, 1915 at a cost of \$646.00."

"The lake was stocked with 329 white perch, grown, brought from Caddo Lake in barrels and bought from Mr. T. J. Taylor. Price paid; 10 cents each."

"The wall across the waterway was built

December 4, 1915 by DeLoach Martin with Elijah Donald and Charlie Gross as helpers."

"The holly tree, bamboo, Cherokee rose and dogwood trees at west end of the lake planted January 1, 1916."

"The lake house was erected some months prior to building the dam, it being erected in July 1914 by Ed Kessler, and cost about \$200.00."

"The stable was used as a tool house when the



*Part of Litt Martin's negotiation to buy the land was to build a new log cabin.*



*This foot powered sharpener sits on Martin's porch. To this day, he still uses it to keep yard and garden tools sharp and ready.*

Post Office building was erected in Marshall. It was taken down and re-erected at the lake place by John Eason in March 1915."

"W.L. Martin, wife and children and Miss Mary DeLoach spent two weeks at this house in August 1915 and at this time the lot fence was put up and many little conveniences added to the house. During this time the storm at Texas City and Galveston occurred. The entire family

is interested in making this not only a pleasant rendezvous, but a pretty one as well and to that end are spending some thought and energy."

"The little boat used on the lake was built by Mr. Louis Wachlerl at a cost of one dollar."

**March 29, 1916:**

"W.L. Martin & son DeLoach again here for the night. Made a tour around the lake

looking for bullfrogs with the flashlight but none could be found and we presume it is rather early for them, although we heard one bellow. We saw a fish strike, evidently a white perch. The dogwoods are in full bloom and are beautiful."

**July 22, 1916:**

"Mary Fraley has been visiting in Marshall for some time. I invited a small crowd to come out for a swim, she being very fond of the water and a beautiful swimmer. The party was a very small one, being composed of Mary, Winnifred Brownrigg, Edwin Womack and myself, with Aunt Annie and Aunt Mary for chaperones. Mother had fixed up a nice lunch for us which was very much enjoyed by all, and this outing proved to be a very delightful one."

**September 4, 1916:**

"The family and Aunt Mary spent last night and to-day out here. Raised the waste-way six more inches, which will increase the size of the lake very much with the next big rain. We also had a new spring board put up and did some improving on the boat house. The work on the spring board, waste-way and boat house was done by Mr. W. L. Martin, DeLoach Martin, Jack Nickerson and Ligg.

**Christmas Morning, December 25, 1916:**

"Mr. W.L. Martin, DeLoach Martin and Clyde B. Terrell motored out to visit the lake and investigate the possibilities of developing feeding places for wild ducks. Many of the plants suggested are beautiful ornamental

plants, they provide food for wild fowl and fish and make it possible for them to stay around this "Garden of Eden." Plants will be collected if desired by writer. Best wishes to the Martin's for the very pleasant Christmas as shown."

**February 9, 1917:**

"A party of four left the dance at Newman's hall about 11:15 for the lake. On arrival we built a fire and had supper which was as follows: Noodle soup, bread, coffee, crackers and water. After supper all indulged in a poker game. Jack Merriwither was the first to be frozen out followed closely by D. Martin and after a close game for about an hour Heartsil Clark was out and Chas. Adams was the champion for the night. At 2 o'clock we retired."

**May 8, 1917:**

"This evening Ed Womack, Charley Martin, W. G. Pierce, Jr, mother, father and sister and myself came out. Spent a quiet evening and everybody returned at about six except Ed and I who stayed and in a few minutes caught enough white perch and bream for our supper which were the first caught out of the lake. After a rather early supper of fried fish we went to bed."

**May 9, 1917:**

"Arose early this morning and went to town as we both had to be at work at 8 O'clock. This was the last night that Ed could have come out here as he was going to the Officers Training camp at Leon Springs on the morning of the 10th."

As the lake register went on, pages included girlfriends, wives and children. There were a few entries about men going off to the service, activities in town, but mainly time spent at the lake. Reading the pages was like going back in time or watching a movie, lots of smiles, laughs and even a few tears. There is very little mention of WWI, so we know the lake was a place of peace and happiness.

What makes Martin's Lake so special is not the fact that it is the oldest existing dam, or that it was passed down from generation to generation; but what they did there. A big thank you to Litt Martin for his generosity in sharing all this with us.

*Earthmover Mike Otto can be reached at [mikeotto@ottosdirtservice.com](mailto:mikeotto@ottosdirtservice.com) or via the magazine at [pondboss@texoma.net](mailto:pondboss@texoma.net)*



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# The Gentle Balance

by Sherman Wyman

I find myself once again learning about Mother Nature's yin and yang. Events occur that are not consistent with "normal" or "averages."

Let me explain.

During spring and summer 2007, weather patterns were strange. There were extraordinary rain events in part of the southwest, while the south and southeast broiled under excessive drought conditions. Some areas of the country got average rains and others were a bit needy.

At my ranch in north Texas, we received more than 50 inches of rain where "normal" is 25. While that much rain makes up deficits in area reservoirs, it does some different things to the plains and riparian areas.

Most of our rains came in the form of "training," where a low pressure system from the west meets warm moist air pushing up from the Gulf of Mexico. The two systems collide.

As they meet, thunderstorms form and rain falls, sometimes in sheets. One storm after another forms, typically pushing southwest to northeast, in a series, like a train. Areas directly underneath may be inundated with 5-8 inches of rain, sometimes in less than 24 hours. In my part of the nation, this occasionally happens during late spring and summer months, but rarely does it happen time after time for several months in a row. Well, in 2007, it happened four or five times to much of Texas.

At the ranch, prairie grasses thrived, wildlife flourished and ponds were full to the brim.

All seemed right with the world.

All of us knew, come fall and winter, if the rain stopped, the danger of fire would be high due to excess growth of prairie plants.

But, for the time, the summer months were very pleasant. The entire part of the state was thankful for the cool blessing.

Sure enough, the rain ceased...and ceased...and ceased. Over a span of five months, we received less than an inch of rain.

We went from flash floods to mini-drought.

Nearby wheat farmers need rain and cattle ranchers need greener pastures.

It still seemed okay, as spring always brings some rain, so no big deal, right?

Wrong!

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**I began to get word from many of my quail hunting friends that their favorite hunting grounds were suddenly void of quail about the middle of November.**

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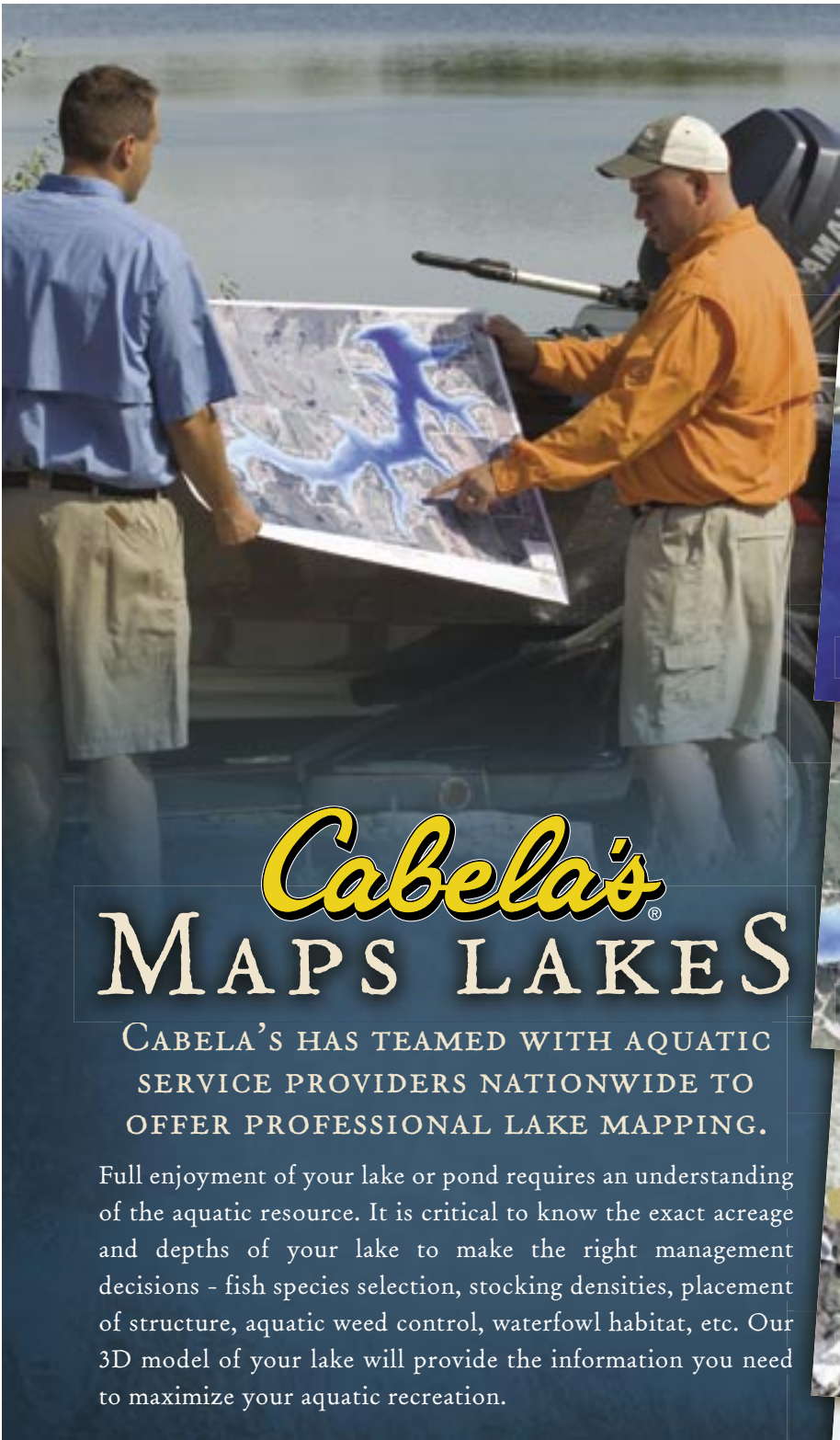
I began to get word from many of my quail hunting friends that their favorite hunting grounds were suddenly void of quail about the middle of November. In years past, these were lands that have teemed with coveys, even in drought-stricken years. These ranches benefited from similar rains as I had 200 miles away. Young hatchlings were seen everywhere during spring and summer. We all had visions of a season reminiscent of the good old days of the

*continued on page 66*



*Tall, thick grasses make for difficult walking. As the grasses fall, they mat, preventing quail from easily accessing natural foods.*





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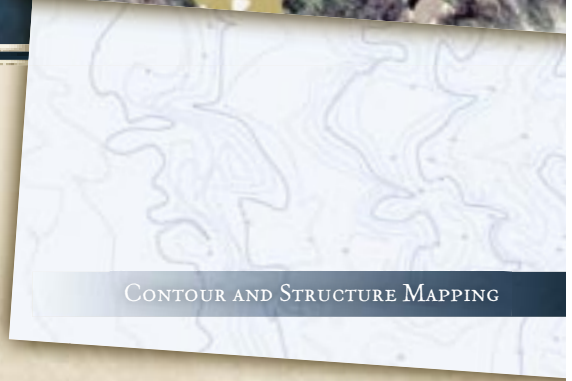
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*This emaciated quail was surviving exclusively from corn supplied by the landowner. Its natural sources of food were not available when needed.*

70's but reports were birds had vanished.

Initially I brushed off the remarks as a local issue. I dismissed them to dry conditions. I simply thought the dogs couldn't smell and the grasses were so tall and heavy that the birds were eluding hunters.

About the first of December I spent four days afield and realized that at daybreak I heard no quail whistling and noticed my house covey had



*This is an example of thick, matted grass. Quail can't access the plentiful seeds, nor can sunlight penetrate enough to grow the natural winter greens we would ordinarily see.*

gone from 20 birds to 11 almost overnight.

Since I do not hunt the house covey it dawned

on me I needed to investigate.

I went quail hunting, hunted all the normal spots and flew one covey when I should have found at least four.

Uh, oh, something is up for sure. I shot a bird and immediately noticed it was emaciated. I brought the creature back to the house and autopsied it. The most obvious thing I noticed was the bird had all kinds of signs that it was starving. It had no food in its craw, gizzard or stomach. What the heck, I thought? I found another small covey and took another bird. Same story. Weird.

I called the local state biologist and asked him. He confirmed quail were disappearing and his department was studying the cause. His preliminary results indicated mass starvation.

I called all my quail hunting buddies and asked them to study the few birds they were taking. Same conclusion, over and over, even several hundred miles away.

How could quail be starving with so much cover and grass? There are sunflowers, ragweed and other desirable plants...everything in mass quantities.

Yes, we're in a mini drought so green clovers and late winter greens that quail eat are missing,

*continued on page 73*

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## On Northern Pond...

*continued from page 19*

out to be quite a chore – many people ice fished for many days. The 10 smallies, on the other hand, were collected in just one day.

Now, an interesting little tidbit for you anglers. Dan and his helpers were fishing and searching for fish with underwater cameras. They found largemouth bass tended to school and move together in groups. These were 10 to 14 inch bass, and we often speak of them as wolf packs. Well, Dan would wait and wait, and then a wolf pack would approach! When you HAVE to catch fish, and not exaggerate the numbers because it is a research project, you can't be missing chances. Here's what Dan found. In days of fishing that pond, they never caught a largemouth bass on a live minnow under a bobber. They only caught bass on jigs – they had to tease those largemouths into biting.

So, that's the "set-up" on the research project, and the reason for it. We hope that an initial year of good information on temperature, light, and dissolved oxygen can provide some insights into this potential super-cooling problem. Stay tuned for results!

*Dr. David W. Willis is a fisheries biologist and head of the department at South Dakota State University. He can be reached via the Pond Boss Forum at [www.pondboss.com](http://www.pondboss.com).*



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## Beyond the Shoreline

*continued from page 66*

but, holy cow, last summer's seeded plants were still dropping and that had never happened this late into winter.

It has been a strange puzzle. I would understand if predators were eating them, like they have deer and turkey all season. After all, predators can sneak up on their next meal through the tall grass with ease, but quail? They are little harder to sneak up on. I suspect predators have gotten their fair share but this decline in quail numbers was too disproportionate to be caused by predators.

The cause finally dawned on me as I was running some dogs for practice with a friend on a usually awesome quail ranch in December. His quail were starving, so he recently put out 20 feeders and stopped all hunting. But, the dogs, rusty from a lack of field time, needed to run and work and do what good dogs do. So, there we were, gun-less, walking behind the dogs watching them work.

Broomweed was so thick we could barely walk through it. This stuff was thigh high when it's normally knee high. Grasses beneath broomweed were so thick you couldn't see the cactus under the grass mat. Incredibly tough walking.

BINGO! It hit me. The grass mat. Grasses have fallen over and the mat is so thick and tangled it has completely covered the ground. When seeds fall there is no bare ground underneath for birds to find the food.

The few spots where matting is less dense had been picked clean. There wasn't a seed in sight. Because of our new drought, the normal greens in the barren areas had not yet sprouted.

The gentle balance of nature was suddenly showing itself again. Too much of a good thing isn't necessarily a good thing.

I leave you with this, if you live or hunt in a similar habitat just described, pay attention to your abundance as closely as you do what is lacking. Nature's yin and yang are pendulums which always swing. It seems our job is to recognize the extremes and try to watch each high side of the swing and be ready to dodge the pendulum as it begins to fall toward us. Now, I find myself feeding quail during a time when Nature's supper table should be a smorgasbord for birds while my supper table should have plenty of succulent, fat quail, roasted over coals, served with fresh greens and new potatoes.

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Contact: Jeremy Liley – jeremy@qorconsult.com

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# What's Happening...

by Bob Lusk

### Bass 201 in Texas

BASS 201 will be held March 28 & 29, 2008 at the Texas Freshwater Fisheries Center, in Athens, Texas. Dr. Michael Masser, Fisheries Extension Specialist with the Texas A&M University—Texas Cooperative Extension Service and Department of Wildlife and Fisheries Sciences presents this seminar in cooperation with the Texas Parks and Wildlife Department. BASS 201—Managing Private Impoundments for Better Fishing promises to have hands-on demonstrations of water quality testing, electrofishing, identifying weeds and more. They also plan to talk about Pond Ecology: Building Better Habitat; Solving Water Quality Issues; Stocking for Success; Improving Existing Ponds and Lakes; Aquatic Vegetation and much more. Pay before March 15 and it will cost \$50. After March 15th it will be \$75. For information on this outstanding seminar, contact Dr. Masser directly at [mmasser@tamu.edu](mailto:mmasser@tamu.edu) or call (979)845-7370.

### Pond Boss Conference and Expo

The 2nd Pond Boss Conference and Expo will be July 11 & 12 at the Arlington Convention Center, Arlington, Texas. If you haven't signed up, yet, don't wait. It will sell out. Meet Ray Scott, the father of bass fishing and founder of B.A.S.S. along with Dale Hall, the director of the U.S. Fish & Wildlife Department. He is a self-professed "fish head" from Louisiana and is excited to be able to address the group and spend time with us. The Expo is shaping up nicely and promises to be better than last year. Make plans now! Don't be left out. Look for the registration forms in this issue of Pond Boss.

### Veteran Writer Prepares Debut Article in Pond Boss

Long time outdoor writer, Larry Bozka, of Seabrook, Texas, is poised to make his Pond Boss debut. The award winning Bozka is best known for his contributions in founding several long time hunting and fishing magazines. His career spans back into the 1970's with

contributions to most major hook and bullet magazines in the United States. Now, Bozka operates [www.CoastalAnglers.com](http://www.CoastalAnglers.com), a website directed at his deepest passion, saltwater fishing. Bozka has close ties with the pond management industry. He works with Anderson Minnow Farms of Lonoke, Arkansas, with their public relations. He also works with one of his long time buddies and good Pond Boss friend and advertiser, Kenneth Henneke, of Hallettsville, Texas. In the May-June issue of your favorite magazine, Bozka will write a story about the ups and downs of feeding "millions" of shiner fry to your gamefish pond. Bozka is also an outstanding photographer. He just bought some new equipment for close-up shots. Be on the lookout for some of his photos. Oh, look, here's one...in this column. You probably saw that picture of a bass with a minnow tail protruding from his mouth well before you read these words. Welcome, Larry Bozka!

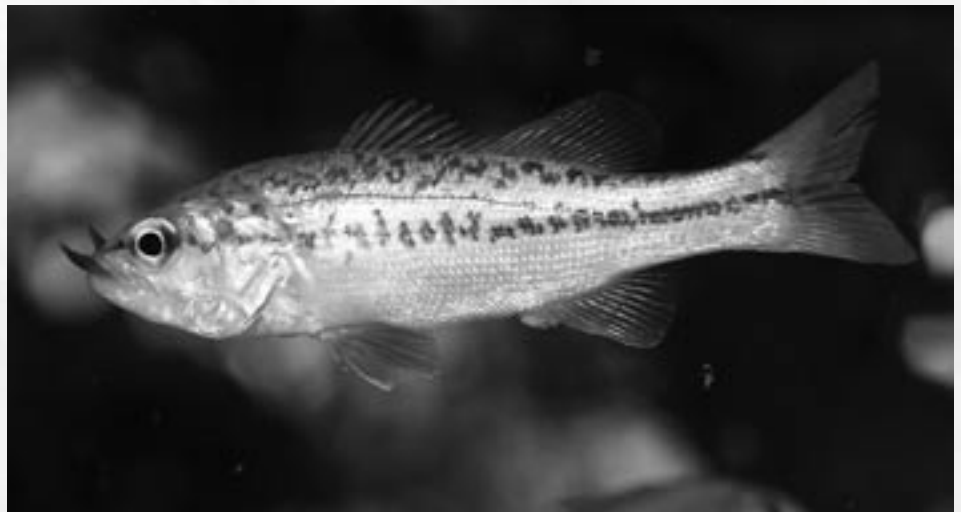
### EasyPro's New 2008 Catalog is Now Available

Our good friend, Dave Ouwinga with Stoney

Creek Fisheries and Equipment announced EasyPro Pond Products of Grant, Michigan has released their new catalog for 2008. They have increased their product line and offer a large catalog packed with professional and do-it-yourself pond products. There are many new items for the coming year featuring the EasyPro brand. For a catalog or more information call 800-448-3873 or email [info@EasyProPondProducts.com](mailto:info@EasyProPondProducts.com).

### Clean Water Symposium

Montana State University Billings College of Business is hosting a "Clean Water Symposium" July 10-11th, 2008, sponsored by the university, Fiberbond and Floating Island International. The theme is "Technology and practices committed to improving our planet's water quality." Floating Treatment Wetlands represent an exciting new technology capable of addressing a multitude of today's environmental issues. Attendance is limited. For information, contact [jacque@floatingislandinternational.com](mailto:jacque@floatingislandinternational.com)



*This 4 inch bass made short work of a fathead minnow in Larry Bozka's aquarium. Bozka, an excellent photographer and award winning writer will begin contributing to Pond Boss.*



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## News Shorts

*continued from page 74*

### The Texas Brigades Camps

We received a nice email from a Pond Boss subscriber who is a big supporter of the Texas Brigades Camps. These are Youth Leadership Camps where 13-17 year old young people, interested in the outdoors, learn about Texas game fish and wildlife species.

However, they are not just fishing and hunting camps. The camps go beyond the scope of just learning to fish or hunt.

Founded in 1993, by Dale Rollins, Ph.D., Tom Green County Agricultural Extension Agent, to deal with the rapidly declining Texas bobwhite quail population, interest grew, and in 1996 came to include whitetail deer studies. In 2004, saw continued interest that came to include a largemouth bass camp.

There are four types of camps, the Bass Brigade, two Bobwhite Brigade camps, two Buckskin Brigades, (Rolling Plains and South Texas), and Feathered Forces (dove/wild turkey) all devoted to teaching youth not just about the five most popular species fished or hunted in Texas, but about their associated

aquatic and terrestrial environment.

At each camp, cadets learn about land and water conservation (habitat fragmentation and restoration), specie's anatomy and physiology, native versus invasive plants, water shed management, fish and wildlife surveys, state and federal fishing/hunting laws, public speaking, business correspondence, print and electronic media journalism, and team building, which comes through cadence marching and game participation.

Cadets compete across the state of Texas, for one of the approximately 30 seats offered at each of the summertime camps. Each brigade

camp is 4.5 days – 100 hours long, with each day beginning approximately 6:00 in the morning and finishing between 11:00 – 11:30 at night. While intensive in nature, it is rounded with light-hearted fun. Interested students should contact the following:

Texas Brigades  
Attention: Executive Director - Helen Holdsworth  
2800 N. E. Loop 410, Suite 105  
San Antonio, Texas 78218  
210-826-2904 or 1-800-839-9453  
Website: [www.texasbrigades.org](http://www.texasbrigades.org)



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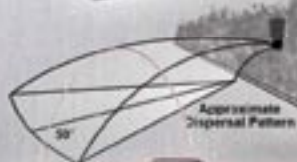
Approximate Dispersal Pattern



## ADF-250X

### 6 Gallon Digital Directional Poly Pail Fish Feeder

25# feed capacity  
Exclusive directional feeder control system  
Targeted placement of food  
6V digital power control unit  
Ideal for use along ponds, streams and lakes  
*Easy to assemble*  
*Varmint proof*



Approximate Dispersal Pattern

**FOUR**  
PRODUCT WARRANTY  
**YEAR**

## ADF-750

### Directional Fish Feeder

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Patented dual motor dispersal technology  
Targeted placement of food  
12V directional digital timer  
8 available feed times, from 1 to 90 seconds  
Ideal for use along ponds, streams and lakes  
Includes universal battery charger  
Adjustable foot pad mounting kit



Approximate Dispersal Pattern

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Patented dual motor dispersal technology  
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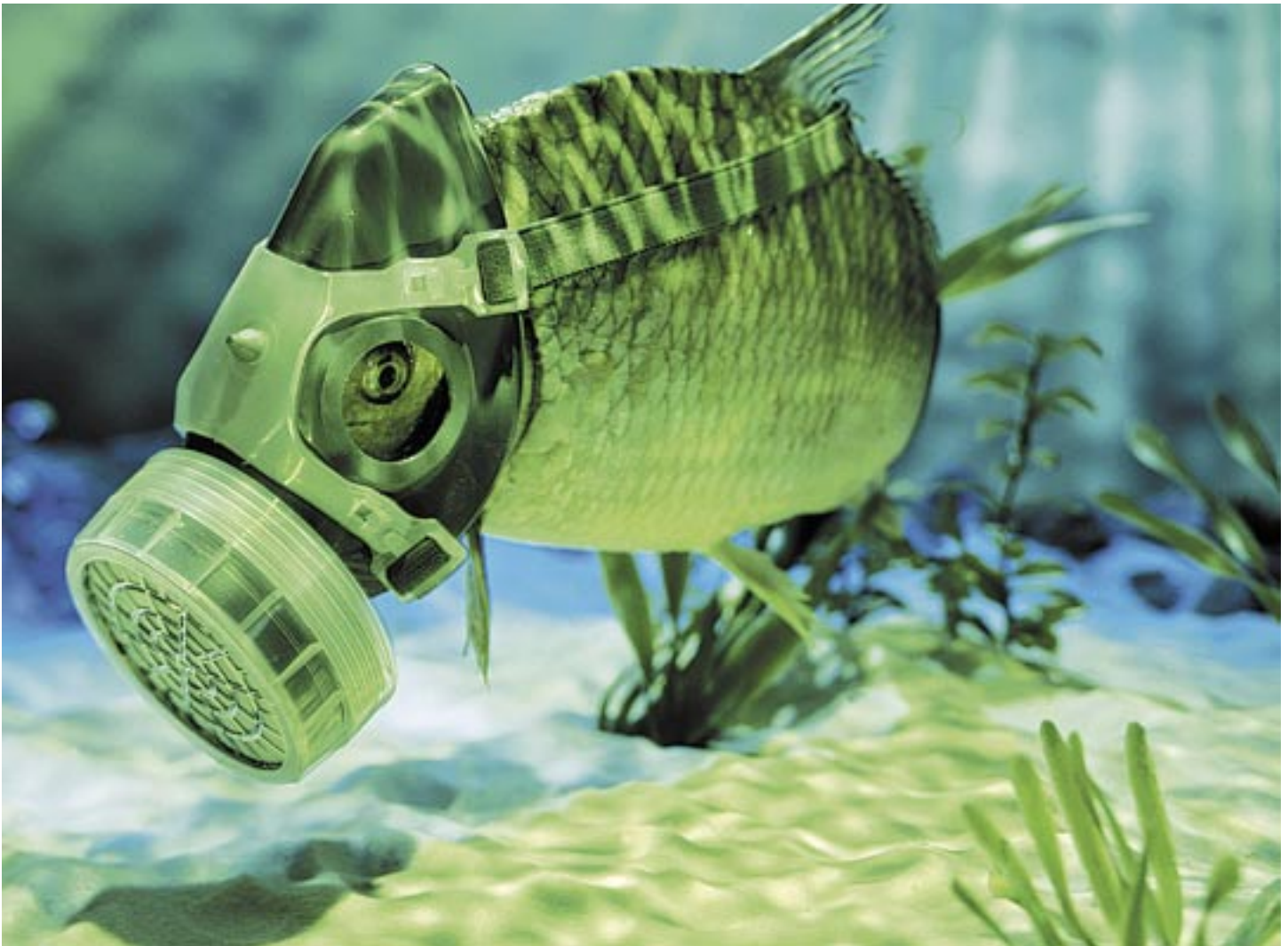
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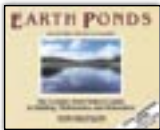
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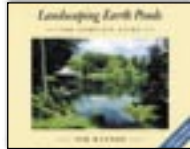
## WATER WEEDS AND ALGAE

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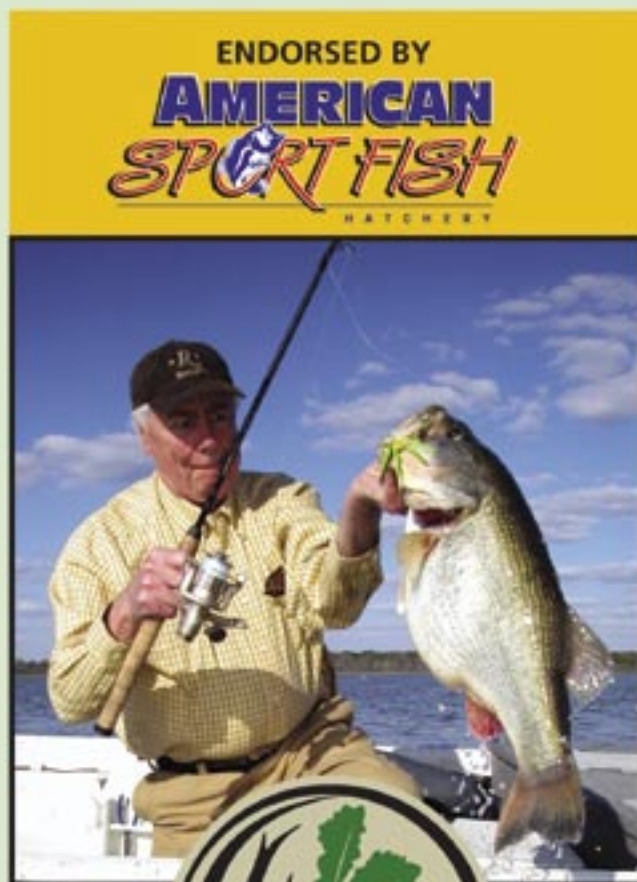
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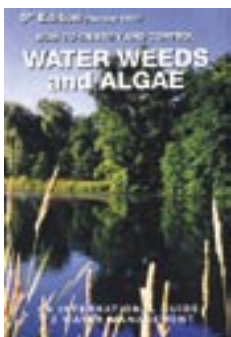
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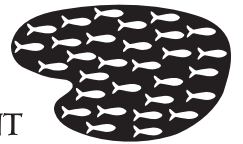
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